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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

November 8, 1983 Volume 1036 Number 2

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the Official Gazette at 1017 O.G. 10 on Apr. 13, 1982. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States, see the notice in the Official Gazette of Sept. 28, 1982 at 1022 O.G. 52.

Note that the domestic PCT fees have been increased as of Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. Also note that the international PCT fees have changed as of Jan. 1, 1983 and the Search Fee for the European Patent Office as Searching Authority changed as of Jan. 22, 1983. The notice regarding the change in international fees and the Search Fee for the European Patent Office appeared at 1025 O.G. 27, on 28 Dec. 1982. The current schedule of fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	670.00
International Fees	
Basic Fees (first 30 pages)	265.00
Basic Supplemental Fee (for each page over 30)	5.00
Designation fee (for each national or regional office)	65.00

GERALD J. MOSSINGHOFF,
Dec. 3, 1982. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,022,529, Re. S.N. 524,696, Filed Aug. 19, 1983, Cl. 356/318, FEATURE EXTRACTION SYSTEM FOR EXTRACTING A PREDETERMINED FEATURE FROM A SIGNAL, John U. White, Owner of Record: *Inventor,* Attorney or Agent: Lee C. Robinson, Jr., et al., Ex. Gp.: 257

4,024,065, Re. S.N. 505,755, Filed June 20, 1983, Cl. 210/315, FILTER FOR LIQUID MATERIAL, Howard William Morgan, Jr., Owner of Record: *Filter Specialists, Inc., Michigan City, Ind.,* Attorney or Agent: James D. Hall, Ex. Gp.: 176

4,122,024, Re. S.N. 342,946, Filed Jan. 26, 1982, Cl. 430/111, CLASSIFIED TONER MATERIALS, Lewis O. Jones, et al., Owner of Record: *Xerox Corp., Stamford, Conn.,* Attorney or Agent: J. E. Beck, et al., Ex. Gp.: 166

4,280,000, Re. S.N. 515,920, Filed July 20, 1983, Cl. 435/242, METHOD FOR OBTAINING MOLD SPORE MATERIAL, Peter P. Kozak, Jr., et al., Owner of Record: *Leo H. Cummins & Sherwin A. Gillman, Santa Ana, Calif.,* Attorney or Agent: Gordon L. Peterson, Ex. Gp.: 172

4,321,978, Re. S.N. 444,862, Filed Nov. 26, 1982, Cl. 180/225, INTAKE SYSTEM FOR MOTORCYCLE ENGINES HAVING V-SHAPED CYLINDER ARRANGEMENT, Nobuyoshi Tominaga, et al., Owner of Record: *Yamaha Hatsudoki, Kabushiki Kaisha, Iwata, Japan,* Attorney or Agent: Ernest A. Beutler, Ex. Gp.: 316

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,105,391, Reexam. No. 90/000,455, Requested: Oct. 7, 1983, Cl. 425/526, INJECTION BLOW MOLDING MACHINE, Katashi Aoki, Owner of Record: *Nissei ASB Machine Co., Ltd., Tokyo, Japan,* Attorney or Agent: L. A. Maxham, Ex. Gp.: 140, Requester: Cincinnati Milacron Industries, Inc., Cincinnati, Ohio

4,157,276, Reexam. No. 90/000,451, Requested: Sept. 30, 1983, Cl. 162/348, PAPER MACHINE FABRIC IN AN ATLAS BINDING, Hermann Wandel, et al., Owner of Record: *Herman Wangner, GmbH & Co. K.G., Reutlingen, Germany,* Attorney or Agent: Ronald J. Baron, Ex. Gp.: 170, Requester: Owner

4,334,944, Reexam. No. 90/000,456, Requested: Oct. 7, 1983, Cl. 156/308.2, METHOD OF PREPARING POLYUREA FOAM MATERIALS, Hubert S. Creyf, Owner of Record: *PRB N.V., Brussels, Belgium,* Attorney or Agent: Buell, Blenko, et al., Ex. Gp.: 161, Requester: Upjohn Co., North Haven, Conn.

4,370,592, Reexam. No. 90/000,457, Requested: Oct. 7, 1983, Cl. 313/414, COLOR PICTURE TUBE HAVING AN IMPROVED INLINE ELECTRON GUN WITH AN EXPANDED FOCUS LENS, Richard H. Hughes, et al., Owner of Record: *RCA Corp., New York, N.Y.,* Attorney or Agent: Eugene M. Whitacre, Ex. Gp.: 250, Requester: Owner

4,387,297, Reexam. No. 90/000,453, Requested: Oct. 4, 1983, Cl. 235/462, PORTABLE LASER SCANNING SYSTEM AND SCANNING METHODS, Jerome Swartz, et al., Owner of Record: *Symbol Technologies, Inc., Hauppauge, N.Y.,* Attorney or Agent: Alan Israel, Ex. Gp.: 210, Requester: Owner

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DEPARTMENT OF THE TREASURY
UNITED STATES CUSTOMS SERVICE

(T.D. 83-178)

RECORDATION OF TRADE NAME: "UNDERGROUND CAMERA, INC."

Agency: U.S. Customs Service, Department of the Treasury

Action: Notice of Recordation

Summary: On May 6, 1983, a notice of application for the recordation under section 42 of the Act of July 5,

1946, as amended (15 U.S.C. 1124), of the trade name "UNDERGROUND CAMERA, INC." was published in the Federal Register (48 FR 20531). The notice advised that before final action on the application, consideration would be given to relevant data, views, or arguments submitted in opposition to the recordation and received not later than July 5, 1983. No responses were received in opposition to the application.

Accordingly, as provided in section 133.14, Customs Regulations (19 CFR 133.14), the name "UNDERGROUND CAMERA, INC." is recorded as the trade name used by Underground Camera, Inc., a corporation organized under the laws of the State of Massachusetts, located at 369 Central St., Foxboro, Mass. 02035. The trade name is used in connection with photographic equipment, namely, cameras and lenses; photographic supplies, namely, photographic film and chemicals; and photographic accessories, namely camera supports and illuminators. The trade name is applied to the goods in the United States.

Date: Aug. 25, 1983

For Further Information Contact: Harriet Lane, Entry, Licensing and Restricted Merchandise Branch, U.S. Customs Service, 1301 Constitution Ave., NW., Washington, D.C. 20229 (202-566-5765).

DONALD W. LEWIS,
Aug. 19, 1983. *Director, Entry Procedures and Penalties Division.*

DEPARTMENT OF THE TREASURY
UNITED STATES CUSTOMS SERVICE

(T.D. 83-176)

RECORDATION OF TRADE NAME: "UNITED ASSOCIATION OF JOURNEYMEN AND APPRENTICES OF THE PLUMBING AND PIPE FITTING INDUSTRY OF THE UNITED STATES AND CANADA"

Agency: U.S. Customs Service, Treasury

Action: Notice of Recordation

Summary: On May 11, 1983, a notice of application for the recordation under Section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "UNITED ASSOCIATION OF JOURNEYMEN AND APPRENTICES OF THE PLUMBING AND PIPE FITTING INDUSTRY OF THE UNITED STATES AND CANADA" was published in the Federal Register (48 FR 21231). The notice advised that before final action on the application, consideration would be given to relevant data, views, or arguments submitted in opposition to the recordation and received not later than July 11, 1983. No responses were received in opposition to the application.

Accordingly, as provided in section 133.14, Customs Regulations (19 CFR 133.14), the name "UNITED ASSOCIATION OF JOURNEYMEN AND APPRENTICES OF THE PLUMBING AND PIPE FITTING INDUSTRY OF THE UNITED STATES AND CANADA" is recorded as the trade name used by the United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry of the United States and Canada, an incorporated association, located at 901 Massachusetts Ave., NW., Washington, D.C. 20001. The trade name is used by the Association to identify its union activities, which include the formation of local labor unions in the plumbing and pipe fitting industry, as well as certifying (1) that pipe, fabricated pipe, welded pipe and fabricated welded pipe formations were made by members of the United Association's local unions and (2) that the services of fabricating and assembling such goods were performed by members of United Association's local unions. The Association's member unions and their members are authorized to use the trade name in the United States and Canada.

Date: Aug. 24, 1983

For Further Information Contact: Harriet Lane, Entry, Licensing and Restricted Merchandise Branch, U.S. Customs Service, 1301 Constitution Ave., NW., Washington, D.C. 20229 (202-566-5765).

DONALD W. LEWIS,
Aug. 19, 1983. *Director, Entry Procedures and Penalties Division.*

Adverse Decisions in Interference

In the designated interference involving the indicated claims of the following patents, final decision having been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,913,129, Carl J. Snyder, Albert H. Maxwell, Jr. and William P. Doby, OUTAGE INDICATING APPARATUS FOR METER TELEMETRY SYSTEMS INCLUDING DATA RECORDERS, Interference No. 100,498, decided Apr. 29, 1983, claim 1.

Patent No. 3,913,828, Paul A. Roy, REINFORCING ULTRA-CENTRIFUGE ROTORS, Interference No. 100,429, decided Mar. 10, 1983, claims 1, 2, 4, 5 & 6.

Patent No. 3,921,207, William P. Doby and Albert H. Maxwell, Jr., OUTAGE INDICATING APPARATUS FOR METER TELEMETRY SYSTEMS INCLUDING DATA RECORDERS, Interference No. 100,497, decided Apr. 29, 1983, claim 1.

Patent No. 3,959,236, Jan Peska, Milan Benes and Jiri Stamberg, POLYMERS AND COPOLYMERS OF HYDROXYALKYL METHACRYLATE SULFO ESTERS AND THE METHOD FOR THEIR MANUFACTURING, Interference No. 99,511, decided Mar. 25, 1983, claims 1, 3, 6 & 7.

Patent No. 4,016,043, Antonius H.W.M. Schuurs, Bauke K. Van Weemen and Gerrit Wolters, ENZYMATIC IMMUNOLOGICAL METHOD FOR THE DETERMINATION OF ANTIGENS AND ANTIBODIES, Interference No. 99,978, decided May 23, 1983, claim 2.

Patent No. 4,025,953, Sotirios Sideris, FREQUENCY SYNTHESIZER TUNING SYSTEM FOR TELEVISION RECEIVERS, Interference No. 100,161, decided June 23, 1982, claim 1.

Patent No. 4,065,534, Thomas A. Rechlicz and Bernard A. Maloney, METHOD OF PROVIDING A RESIN REINFORCED ASBESTOS DIAPHRAGM, Interference No. 100,351, decided May 26, 1983, claims 1, 3, 4 & 5.

Patent No. 4,175,464, Ralph Deutsch, MUSICAL TONE GENERATOR WITH TIME VARIANT OVERTONES, Interference No. 100,610, decided Apr. 8, 1983, claims 1–3, 5, 6, 15, 16 & 17.

Patent No. 4,203,992, Eric M. Gordon and William H. Koster, β-BROMOPENICILLANIC ACID SULFONE, Interference No. 100,912, decided June 3, 1983, claims 1 & 2.

Patent No. 4,221,914, Philippe Bey and Michel Jung, ALPHAHALOMETHYL DERIVATIVES OF HISTAMINE AND RELATED COMPOUNDS, Interference No. 100,906, decided Jan. 27, 1983, claim 8.

Patent No. 4,251,223, William I. White SENSITIZERS FOR PEROXIDATIVE ACTIVITY TESTS, Interference No. 100,751, decided May 11, 1983, claims 1–4.

NANNIE B. HENRY,
Deputy Clerk,
Board of Patent Interferences.

PATENT NOTICES

Certificates of Correction for the Week of Nov. 8, 1983

D. 263,720	4,337,178	4,385,195	4,395,396
D. 270,334	4,341,780	4,385,915	4,395,460
Re. 31,247	4,350,793	4,386,135	4,395,566
Re. 31,319	4,358,390	4,386,466	4,396,221
Re. 31,336	4,358,545	4,386,860	4,396,671
3,655,201	4,358,561	4,387,851	4,397,502
4,051,123	4,368,496	4,388,382	4,397,579
4,217,159	4,369,432	4,389,036	4,397,622
4,224,150	4,369,511	4,389,335	4,397,711
4,249,024	4,370,211	4,389,707	4,398,250
4,251,432	4,373,392	4,389,952	4,398,580
4,266,478	4,374,798	4,390,593	4,398,646
4,283,675	4,376,647	4,390,798	4,399,139
4,290,244	4,378,210	4,391,278	4,399,439
4,300,380	4,378,755	4,391,357	4,400,377
4,301,068	4,379,087	4,391,617	4,400,533
4,304,485	4,380,077	4,392,376	4,400,795
4,307,818	4,380,394	4,392,591	4,400,875
4,308,114	4,380,533	4,393,082	4,400,964
4,316,061	4,381,171	4,393,107	4,401,110
4,321,134	4,382,085	4,393,249	4,401,538
4,322,974	4,382,141	4,394,211	4,401,616
4,324,247	4,382,981	4,394,616	4,402,198
4,327,074	4,384,159	4,394,983	4,402,330
4,331,931	4,384,224	4,395,031	4,402,879
4,336,019	4,384,378	4,395,215	4,405,669

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7140
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
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	St. Louis Public Library	(314) 241-2288 Ext. 390, Ext. 391
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
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	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF April 2, 1983

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-16-81
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	11-20-81
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-1-82
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-09-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-12-82
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	5-22-81
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	3-30-81
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-05-81
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	5-12-81
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-25-80
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	1-30-81
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	5-18-81
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—STEPHEN G. KUNIN, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	7-27-81
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	8-27-82
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	11-17-80
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	9-17-80

Expiration of patents: The patents within the range of numbers indicated below expire during April 1983, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,243,822 to 3,248,737, inclusive

Plant Patents ..... Numbers 2,616 to 2,627 inclusive

REISSUES

NOVEMBER 8, 1983

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,438

INFRARED RAY GAS ANALYZING APPARATUS

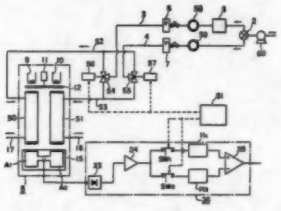
Shinya Ueda, Kawasaki, Japan, assignor to Fuji Electric Co., Ltd., Kanagawa, Japan

Original No. 4,180,733, dated Dec. 25, 1979, Ser. No. 912,144, Jun. 2, 1978. Application for reissue Jul. 31, 1981, Ser. No. 288,877

Claims priority, application Japan, Jun. 2, 1977, 52-70714[U]

Int. Cl.³ G01N *21/26*

U.S. Cl. 250—345 **4 Claims**



3. An analyzing-apparatus using infrared rays for measuring the density of an analysis gas in a sample gas comprising: a first cell irradiated by a first light beam of infrared rays; a second cell irradiated by a second light beam of infrared rays; means for receiving said first and second light beams passed through said first and second cells and providing an output signal in response thereto indicative of a density of the analysis gas contained in said sample gas being measured; and gas supply means for periodically supplying said sample gas containing said analysis gas to one of said first and second cells and a reference gas to the other of said first and second cells and, alternately, supplying said sample gas to said other of said first and second cells and said reference gas to said one of said first and second cells.

PLANT PATENTS

GRANTED NOVEMBER 8, 1983

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,133

ALSTROEMERIA NAMED STAKAROS

Jacob van Andel, Aalsmeer, Netherlands, assignor to B. V. Handelskwekerij/M. C. van Staaveren, Aalsmeer, Netherlands

Filed Dec. 16, 1981, Ser. No. 331,149
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinctive alstroemeria plant, substantially as herein shown and described, characterized by the pink and yellow coloration of its large and profusely blooming flowers borne on strong, upstanding stems.

5,134

IMPATIENS PLANT

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Mar. 2, 1982, Ser. No. 354,043
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of impatiens known by the cultivar name Twinkles, as described and illustrated, and particularly characterized by its sharp clear pink flower color in cool regimes and generally salmon pink flower color in midsummer; variegated foliage; excellent self-branching and procumbent growth habits; high floriferousness, and quick flowering; fast growing and free breaking, providing full and large plant, and by its relatively small flowers.

5,135

IMPATIENS PLANT

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Mar. 2, 1982, Ser. No. 354,057
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of impatiens plant known by the cultivar name Flare, as described and illustrated, and particularly characterized by its compact, superior self-branching habit; bright dark red to a dull red flower color depending on light conditions; variegated to wholly green foliage depending on light conditions; superior floriferousness; excellent keeping qualities for house plant use, and by its adaptability to varying use environments.

5,136

CORTADERIA 'MONVIN'

Gavin Espinosa, Azusa, Calif., assignor to Monrovia Nursery Company, Azusa, Calif.

Filed Jan. 21, 1982, Ser. No. 341,550
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—89 **1 Claim**

1. A new and distinct *Cortaderia selloana* as substantially shown and described herein, that is a superior selection characterized by a unique leaf variegation pattern, a more dwarf-like plant and a female clone which can be relied upon to produce a more showy plume-like inflorescence.

PATENTS

GRANTED NOV. 8, 1983

ERRATA

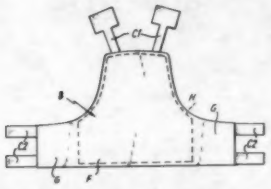
For CLASS	See PATENT NO.
188–067	4,413,387
361–014	4,413,431
401–055	4,413,435
072–071	4,413,485
604–365	4,413,623
198–344	4,413,709
494–017	4,413,771
494–017	4,413,772
494–037	4,413,773
420–578	4,414,027
419–031	4,414,028
423–367	4,414,033
202–248	4,414,072
204–299	4,414,073
203–021	4,414,074
502–169	4,414,132
502–179	4,414,133
502–204	4,414,134
502–224	4,414,135
502–225	4,414,136
502–162	4,414,137
502–073	4,414,138
502–072	4,414,139
502–303	4,414,140
502–314	4,414,141
422–133	4,414,184
526–190	4,414,381
524–494	4,414,385
424–305	4,414,407
381–022	4,414,430
381–048	4,414,431
219–121	4,414,444
369–044	4,414,655

PATENTS

GRANTED NOVEMBER 8, 1983

GENERAL AND MECHANICAL

4,413,357
PROTECTIVE SHIELDS
Michael Sacks, 43 Woodhall Ave., Whitefield, Manchester, England
Continuation-in-part of Ser. No. 91,958, Nov. 7, 1979, abandoned. This application Jan. 7, 1981, Ser. No. 223,045
Int. Cl.³ F41H *1/02*
U.S. Cl. 2—2.5 **10 Claims**



1. A lightweight protective garment to be worn by a person to protect against injury by a bullet or other missile or moving object, said garment having front and back portions and means for interconnecting said portions at the sides and over the shoulders of said person so that the garment can be worn in the manner of a vest,

said front portion having supported thereon a ballistic pack arranged to extend over an area at the front of said person's body,

said ballistic pack comprising a sandwich of layers within an outer cover, said layers comprising: a penetration-resisting layer made up of a plurality of flexible sheets of a closely-woven fabric formed from aramid fibres of high tensile strength and high stretch resistance such as to be capable of resisting penetration by a bullet, and

a backing layer made up of one or more thin, flexible sheets of a semi-stiff impervious plastics material, said backing layer being formed separately to but being held in position relative to said sheet or sheets of said penetration-resisting layer on that side of said penetration-resisting layer which faces towards the person's body, whereby when struck with a bullet or missile or other moving object, said penetration-resisting layer acts to prevent or limit penetration whilst said backing layer acts to limit transmission of impact shock to the person's body.

4. A lightweight protective garment to be worn by a person to protect against injury by a bullet or other missile or moving object, said garment having front and back portions and means for interconnecting said portions at the sides and over the shoulders of said person so that the garment can be worn in the manner of a vest,

said front portion having supported thereon a ballistic pack arranged to extend over an area at the front of said person's body,

said ballistic pack comprising a sandwich of layers within an outer cover, said layers comprising: a penetration-resisting layer made up of a plurality of flexible sheets of a closely-woven fabric formed from aramid fibres of high tensile strength and high stretch resistance such as to be capable of resisting penetration by a bullet, and

an impact-absorbing backing layer, said backing layer being formed separately to, but being held in position relative to said sheet or sheets of said penetration-resisting layer on that side of said penetration-resisting layer which faces towards the person's body, whereby when struck with a bullet or missile or other moving object, said penetration-resisting layer acts to prevent or limit penetration whilst said backing layer acts to limit transmission of impact shock to the person's body

and said front portion also having supported thereon in front of the said ballistic pack an auxiliary shield formed separately from said ballistic pack, said shield comprising a layer of a rigid brittle material having a high degree of hardness which is bonded to a supporting layer comprising one or more sheets of a closely-woven fabric made from aramid fibre of high tensile strength and high stretch resistance.

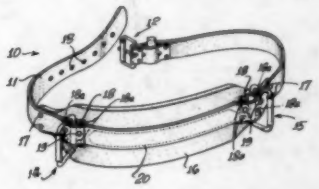
10. A lightweight, armored vest for protecting the wearer against body penetration by a bullet and against blunt trauma from the impact of a bullet,

said vest having a front portion and a rear portion and connection means joining said portions into a vest covering the upper torso of the wearer,

each said portion being formed by an outer cover containing from eight to thirty superposed sheets of flexible, penetration-resistant fabric closely woven with about 31—31 (warp and weft) picks per inch (2.54 cms) from 1000–1500 denier aramid yarn, said sheets being attached to each other as a multi-layered sandwich to prevent bullet penetration,

and said cover containing at least one, thin flexible polycarbonate sheet, about 0.75 mm in thickness, co-extensive in area with the area of said multi-layered sandwich of aramid yarn sheets, as a backing layer for said penetration, resistant layers to absorb and spread shock impact and prevent blunt trauma, from a bullet.

4,413,358
MOTORCYCLE SAFETY BELT
Albert Jimenez, 16225 Sierra Ridge Way, Hacienda Heights, Calif. 91745
Filed Mar. 23, 1981, Ser. No. 246,744
Int. Cl.³ A41F *9/00*
U.S. Cl. 2—321 **4 Claims**



1. A safety belt for use by the driver of a motorcycle which has a rider in addition to the driver to enable the rider on the motorcycle to more easily hold on to the driver, said belt comprising:

a belt member adapted to gird the driver's waist;

buckle means affixed to the belt member to hold the belt member in a secure position around the driver; and

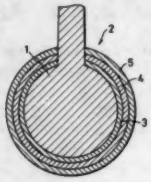
at least two generally rectangular, rigid handle means affixed to the belt member in a manner to prevent movement of the handle means along the belt member, the first of said handle means being affixed so that it is positioned on the side and near the rear of the driver on the right side and the second of said handle means being affixed so that it is positioned on the side and near the rear of the driver on the left side, each of said handle means being affixed to the belt member along one side of the generally rectangular, rigid handle means so that it is pivotable about the side which is affixed to the belt, whereby the rider may grasp the handles and easily and securely hold himself on the motorcycle.

4,413,359

IMPERMEABLE LAMINATE MEMBRANE

Taichiro Akiyama, Tokyo, and Fumio Wada, Tsuruoka, both of Japan, assignors to Koken Co., Ltd., Tokyo, Japan

Filed Feb. 26, 1982, Ser. No. 352,528
Claims priority, application Japan, Mar. 4, 1981, 56-31008
Int. Cl.³ A61F *1/00, 1/24*
U.S. Cl. 3—1 **3 Claims**



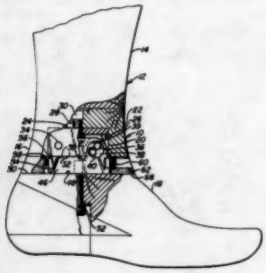
1. An implantable impermeable laminate membrane bag for use in living organisms comprising a laminate of at least one membrane of a cured dimethylsiloxane polymer and at least one membrane of a vinylidene fluoride-hexafluoropropylene-based fluororubber.

4,413,360

ADJUSTABLE PROSTHETIC ANKLE ASSEMBLY

Steve R. Lamb, 2772 Sydney Way, Castro Valley, Calif. 94546, and Larry W. Lamoreux, 5470 Manila Ave., Oakland, Calif. 94618

Filed Oct. 27, 1981, Ser. No. 315,423
Int. Cl.³ A61F *1/04*
U.S. Cl. 3—30 **7 Claims**



6. An ankle assembly for a leg prosthesis having a prosthetic shin member and a prosthetic foot member for adjustment of the foot flexion angle comprising an adjustment mechanism having:

a. a shin connecting member having coupling means for connecting said shin connecting member to the shin member;

b. a foot connecting member having coupling means for connecting said foot connecting member to the foot member;

c. pivotal interconnecting means for pivotally interconnecting said shin connecting member to said foot connecting member said pivotal interconnecting means comprising a pair of spaced eccentric pivots; and

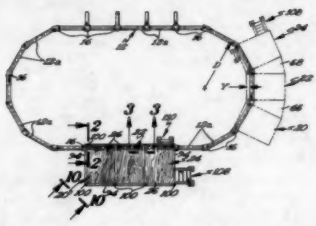
d. locking means for locking said shin connecting member to said foot connecting member in a select pivotal orientation of said shin connecting member relative to said foot connecting member; wherein said locking means comprises a clamping assembly, said clamping assembly having a pair of collar clamps encompassing said eccentric pivots and having an adjustable tightening means operably connected to said collar clamps for clamping said collar clamps around said eccentric pivots on select adjustment of said tightening means, wherein said shin connecting member is locked to said foot connecting member in a selected pivotal orientation.

4,413,361

DECK AND FENCE STRUCTURE FOR ABOVE GROUND SWIMMING POOLS

Donald A. Wolf, Deming, N. Mex.; Clarence G. Smith, Alta Loma, and Charles S. Johnson, Cedar Glen, both of Calif., assignors to Doughboy Recreational, Inc., Cucamonga, Calif.

Filed Nov. 10, 1980, Ser. No. 205,347
Int. Cl.³ E04H *3/16, 3/18*
U.S. Cl. 4—506 **17 Claims**



1. In combination with a portable swimming pool having upright side walls, an improved deck, and deck mounting structure comprising:

a continuous, upright side wall structure defining a swimming pool enclosure;

an elongated seat rest supported on top of said side wall structure along at least a portion of the length thereof, said seat rest including a top wall oriented generally horizontally;

an elevated deck positioned outside of said side wall structure along a portion of the length thereof, said deck having an outer end remote from said side wall structure supported on upstanding, ground engaging members, and said deck having an inner end resting on top of said seat rest top wall and supported thereon;

said seat rest is comprised of a plurality of elongated seat rest sections positioned in abutting, end to end relation along the top of said wall structure, and said deck is comprised of a plurality of deck sections, each of which rests at its inner end on top of one of said seat rest sections with its inner edge overhanging the inside edge of the respective seat rest section inwardly of the pool area defined by said side wall structure;

each of said deck sections is comprised of a deck panel affixed to and supported on a rigid frame, each of said frames including at least one generally horizontally extending support beam; and

means securing said deck to said seat rest top wall comprising an anchoring bracket secured to said support beam of at least one of said deck sections and removably attached to the seat rest section on which said one deck section rests.

4,413,362

SITDOWN SHOWER FOR CHILDREN

Bernard V. Chianco; John B. Chianco, and David B. Chianco, all of 1040 NE. 16th Ter., Fort Lauderdale, Fla. 33304

Filed Dec. 9, 1981, Ser. No. 328,824
Int. Cl.³ A47K *3/022*
U.S. Cl. 4—567 **3 Claims**

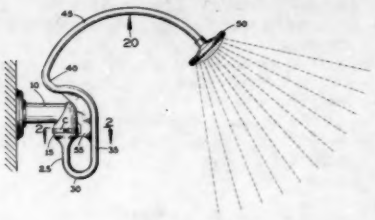
1. For use in a bathtub having a water faucet which extends horizontally forward and then down to a water discharge opening, a shower assembly for releasable attachment to and

support by said water faucet, said shower assembly comprising:

a hollow adapter with an open upper end which is slidably insertable on the faucet from below;

means for releasably clamping said adapter on the faucet to receive water from said water discharge opening in the faucet;

a rigid tube having one end attached integrally to the lower end of said adapter, said tube extending down from said



adapter and then curving upward and forward and passing up in front of said adapter to an opposite end spaced above and in front of said adapter;

a shower head on said opposite end of said tube;

and a connector being integral with and extending between said adapter and said tube, forward of said adapter to said tube where the latter passes up in front of the adapter;

the mounting of said adapter on the faucet constituting the sole means of support for said tube, shower head and connector.

4,413,363

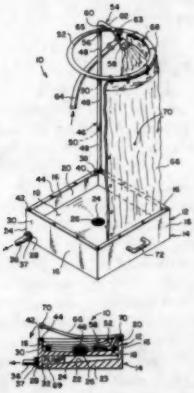
PORTABLE SHOWER SYSTEM

Joseph Troiano, 80 Mahan St., West Babylon, N.Y. 11704

Filed Mar. 8, 1982, Ser. No. 356,185

Int. Cl.³ A47K *3/22, 3/23*

U.S. Cl. 4—599 **3 Claims**



1. A portable shower system, in combination, comprising:

a base member having an inclined base wall four upright side walls, and a flat bottom partition wall spaced above said base wall and coextensive with said side walls, said side walls and said bottom partition wall defining a compartment, said side walls and said base wall defining an inclined cavity beneath said compartment, said side walls having an upright bore and a plurality of first fastening means spaced over the top surface of said side walls, said bottom partition wall having a first aperture connecting said compartment and said cavity and a second aperture connecting the bottom of the inclination of said cavity with the outside of one of said side walls,

a support rod removably mounted in said bore, said rod including a plurality of removably connected rod sections,

a mounting ring,

a shower head,

a mounting means connected to said mounting ring and removably connected to the top of said support rod and said shower head, said mounting means being for positioning said ring and said shower head over said compartment,

a flexible, waterproof curtain removably mounted to said ring and extending downward into said compartment, said curtain having a plurality of second fastening means formed about the mid section of the curtain commensurate with the four side walls, whereby said curtain mid section is capable of being removably connected to said first fastening means so as to form the cover of the compartment with the rest of the curtain being retained within the compartment beneath said mid section,

a source inlet for pressurized water,

a hose means for connecting said source inlet with said shower head, and

said shower system having a dismounted position wherein said shower head, said mounting means with said mounting ring, said rod sections and said curtain are dismounted and positioned in said compartment, said shower curtain mid section being connected to said base member via said first and second fastening means.

4,413,364

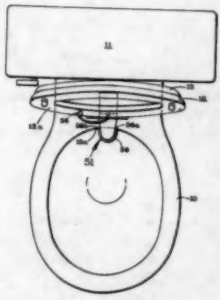
TOILET LIGHT UNIT

Gerald W. Bittaker, and Evidio E. Martinez, both of Miami, Fla., assignors to Charlie I. Pearce, Miami Lakes, Fla.

Filed Feb. 10, 1982, Ser. No. 347,440

Int. Cl.³ A47K *17/00*

U.S. Cl. 4—661 **21 Claims**



1. A toilet light unit comprising:

a housing having means thereon for mounting it on top of a toilet bowl at the back;

and a lamp socket mounted on said housing to extend down in front of the rear inner edge of the toilet bowl when said housing is mounted on top of the toilet bowl at the back;

said housing having a depending front end segment extending down in front and on opposite sides of said socket;

said housing having a bottom wall with an opening therein;

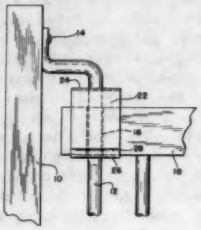
said socket having an electrical terminal at its upper end which projects up through said opening; and

an electrically conductive leaf spring mounted in cantilever fashion at its rear end on said bottom wall of the housing and having its front end overlying said opening and resiliently engaging said socket terminal.

4,413,365
SAFETY LATCH FOR CRIB DROP SIDE

Donald R. Flye, Athol, and Richard T. Heininger, Gardner, both of Mass., assignors to Gem Industries, Inc., Gardner, Mass.

Filed Oct. 6, 1981, Ser. No. 308,984
Int. Cl.[3] A47D 7/02
U.S. Cl. 5—100 10 Claims



1. In a crib having a drop side, a drop side rod on which the drop side is sidable, and said drop side includes a top horizontal rail having an opening through which the drop side rod extends, and means forming a notch in said drop side rod,

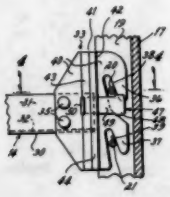
a clip generally embracing said top rail, said clip including two generally parallel flanges apertured to receive the drop side rod, an inset in said clip adjacent one of said flanges, and a spring located on the top rail and bearing on the other of said flanges, the one flange adjacent the inset having a portion thereof generally bearing on the rod, said spring tending to bias the clip causing said portion to enter the notch,

the flanges on the clip being spaced apart a distance greater than the height of the top rail so that the top rail is capable of motion in said clip between flanges, and in one position it is engaged by said inset and in another position it is free of the inset, in which position the clip can be moved to remove the portion of said one flange from the notch whereby the drop side may be lowered.

4,413,366
BED FRAME

Larry W. Whitehead, Lexington, N.C., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed May 26, 1981, Ser. No. 266,717
Int. Cl.[3] A47C 19/00
U.S. Cl. 5—201 3 Claims



1. A bed frame comprising a headboard, a footboard, and a pair of bed rails, said headboard and said footboard both having a pair of vertical slots for the reception of ends of said bed rails, and at least one pin extending across each said vertical slots,

each of said bed rails comprising a longitudinally extending rail having a vertical section at each end of the rail,

a bracket fixedly secured to the vertical section of each end of said rails,

each of said brackets having at least one hook formed thereon, said hook being located in a vertical plane with extends longitudinally of said rail, said hook being insertable into one of said vertical slots and over one of said pins contained within said slot,

a latch mounted for longitudinal sliding movement on each of said brackets, each of said latches being movable between a withdrawn position and an extended position, said latch in said extended position being adapted to cooperate with a hook of the bracket upon which said latch is mounted so as to lock a pin within said hook so as to prevent said bed rail from being disassembled from said headboard or footboard without said latch first being moved into said withdrawn position,

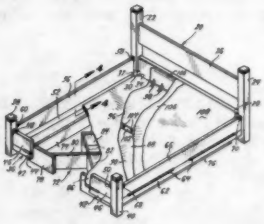
each of said brackets having an offset channel associated therewith, each of said channels extending in a vertical direction, and

a pair of horizontally aligned slots extending through each channel of each of said brackets, said latches being slideably mounted in said slots.

4,413,367
CONFINING FRAME FOR WATER BED

Paul S. Miller, Collinsville, Ill., and Michael J. Rossi, 545 Buena Vista, Edwardsville, Ill. 62025, assignors to Michael J. Rossi, Belleville, Ill.

Continuation of Ser. No. 103,046, Dec. 13, 1979, abandoned.
This application Jun. 16, 1982, Ser. No. 389,095
Int. Cl.[3] A47C 27/08, 19/00
U.S. Cl. 5—411 10 Claims

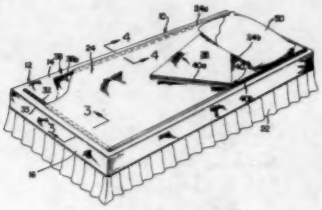


1. A support for a waterbed mattress which comprises a generally horizontal platform, a confining side which is adjacent one side of said platform and which extends upwardly above the level of the upper surface of said platform, a second confining side which is adjacent the opposite side of said platform and which extends upwardly above the level of said upper surface of said platform, said platform and the first said confining side and said second confining side coacting to help define a space for a substantially dimensionally-stable, water-filled mattress which will rest upon said platform and which will have one side thereof and an opposite side thereof confined by said first said confining side and said second confining side, and one of said confining sides having at least a portion thereof which is mechanically independent of and is not secured to and which is selectively and bodily movable toward or away from the adjacent side of a substantially dimensionally-stable, water-filled mattress resting on said platform to support the adjacent side of such a substantially dimensionally-stable, waterfilled mattress and also to apply frictional forces to the edges of a cover which is interposed between said one confining side and the adjacent side of such a substantially dimensionally-stable, water-filled mattress or to expose the adjacent side of such a substantially dimensionally-stable, water-filled mattress and thereby facilitate the positioning and smoothing of an edge of a cover for the adjacent side of such a substantially dimensionally-stable, water-filled mattress in smooth arrangement between the adjacent side of such a substantially dimensionally-stable, water-filled mattress and the inner face of said portion of said one of said confining sides.

4,413,368
COMBINATION BEDSPREAD AND SLEEPING ENCLOSURE

Nina Schuetze, 10108 Homeland Ave., Whittier, Calif. 90603

Filed Nov. 6, 1981, Ser. No. 318,830
Int. Cl.³ A47G 9/00
U.S. Cl. 5—494 4 Claims

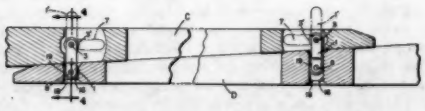


1. A combination bedspread and sleeping enclosure, comprising:
a bedspread adapted to be form-fitted over a mattress;
a sleeping enclosure having an open head end, and a closed foot end, and longitudinal open sides, said enclosure being formed to be positioned on said bedspread;
said sleeping enclosure comprising a single, elongated, rectangular body cover adapted to be transversely folded into first and second half sections, whereby said closed foot end is defined along the transverse fold;
means interposed between said bedspread and said sleeping enclosure for removably securing said sleeping enclosure to said bedspread said removable securing means comprising a first securing fabric-strip member affixed transversely to said body cover adjacent said folded closed foot end; and a second securing fabric-strip member transversely affixed to said bedspread adjacent one end thereof; whereby said first and second securing strips are adapted to engage each other to fasten said sleeping enclosure to said bedspread; and
means formed along said longitudinal open sides of said sleeping enclosure for coupling the respective edges of said open sides to a closed position.

4,413,369
AUTOMATIC DEVICE FOR LAP-JOINT ENGAGEMENT OF TWO BRIDGE ELEMENTS ON INTRADOS OR EXTRADOS AND BRIDGE ELEMENT COMPRISING IT

Michel E. Terrien, and Claude Bouvet, both of Angers, France, assignors to Etat Francais, Paris, France

Filed Aug. 10, 1981, Ser. No. 291,453
Claims priority, application France, Oct. 21, 1980, 80.18256
Int. Cl.³ E01D 15/14, 15/12
U.S. Cl. 14—27 6 Claims

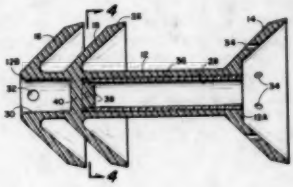


1. A connecting device for permitting the lap joint connection of a first bridge element and a second bridge element, on intrados or extrados, wherein
the first bridge element includes a plurality of fingers, movable from a first position in which they are retracted into the plane of the first bridge element and toward two second positions in which the fingers protrude either on the intrados or on the extrados; and a shaft which is integral with said set of fingers and which is perpendicular to the longitudinal axis of the first bridge element;
the second bridge element includes a plurality of passageways debouching on the intrados and extrados, said passageways being adapted to receive the fingers;
a plurality of bolts which cooperate with said plurality of passageways to lock the fingers in an interlock position; and
a motor which rotates said shaft so as to move the fingers from an unlocked position to the interlock position.

4,413,370
UNITARY PIG FOR USE IN A PIPELINE

Larry D. Payne, Owasso; Hyun J. Cho, and Kishor N. Mehta, both of Tulsa, all of Okla., assignors to T. D. Williamson, Inc., Tulsa, Okla.

Filed Aug. 17, 1981, Ser. No. 293,084
Int. Cl.³ B08B 9/04
U.S. Cl. 15—104.06 R 26 Claims

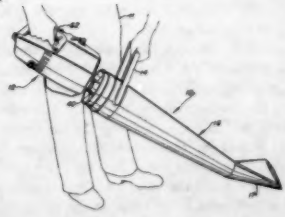


1. An improved pig for use in a pipeline comprising:
an elongated cylindrical body of moldable semirigid material having a forward end and a rearward end;
a plurality of cups integrally extending from said body, each cup extending rearwardly and outwardly to a peripheral pipe engaging surface, at least a major portion of said body having an axial opening therein;
an elongated insert of stiff material received in said axial opening serving to increase the rigidity of said body, said elongated insert having at least one recess in the exterior surface whereby said body and integral cups are cast in place about said insert, material forming said body and cups entering said recess to lock said insert to said body.

4,413,371
BLOWER ATTACHMENT FOR PORTABLE POWER UNIT

Lloyd H. Tuggle, Shreveport, and Ronald C. Loyd, Keithville, both of La., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Jun. 29, 1981, Ser. No. 278,694
Int. Cl.³ A47L 5/14
U.S. Cl. 15—405 18 Claims



1. An air blower attachment for a portable power supply unit comprising:
a housing including means forming an air inlet opening;
an impeller rotatably mounted in said housing and including

shaft means operable to be drivably connected to power takeoff shaft means on said power supply unit; and

means for coupling said air blower to said power supply unit comprising a boss on said power supply unit including a longitudinal bore, and a tubular sleeve secured to and extending from one end of said housing and adapted to be inserted in said bore in said boss in close fitting engagement with said boss, said impeller shaft means extending within said tubular sleeve into engagement with said power takeoff shaft means.

4,413,372

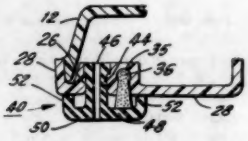
SHOE ATTACHMENT FOR WET/DRY ELECTRIC VACUUM CLEANER

Robert C. Berfield, Jersey Shore, Pa., assignor to Shop-Vac Corporation, Williamsport, Pa.

Filed Nov. 12, 1981, Ser. No. 320,721

Int. Cl.³ A47L 9/02

U.S. Cl. 15—414 **12 Claims**



1. A shoe attachment for the intake of a suction device, like a vacuum cleaner, or the like,

wherein the suction device includes an intake conduit, means for supplying suction force to the intake conduit, and the intake conduit having an end having an intake orifice into which material is sucked by the suction force; means communicating with the intake conduit for receiving material sucked into the intake orifice; the intake conduit being shaped for defining the intake orifice as a relatively narrow opening measured along one dimension of the intake orifice;

the shoe attachment for the intake comprising upstanding walls extending into the intake orifice, a plate extending beneath the end of the intake conduit at which the intake orifice is defined, the walls standing up from the plate, whereby the walls and the plate together close off flow through the intake orifice;

an inlet opening through the plate and defined by and extending between the walls of the shoe attachment and communicating into the intake conduit, wherein the inlet opening is narrower along the same one dimension than the intake orifice for increasing the air speed and/or the suction force at the inlet opening, as compared with the air speed and/or suction force that would be present at the intake orifice were the shoe attachment absent;

the shoe attachment is, at least at the plate thereof, comprised of a flexible and resilient material that is thick and flexible enough to deform to conform to irregularities in the surface over which the plate is moved as the intake conduit and inlet opening are moved across the surface to be suctioned.

4,413,373

PIVOT HINGE WITH REMOVABLE DOOR CLOSING DEVICE

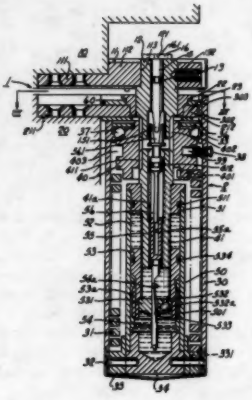
Ryoichi Sasaki, Funabashi, Japan, assignor to Nippon Electric Industry Co., Ltd., Tokyo, Japan

Filed Jun. 29, 1981, Ser. No. 278,463

Claims priority, application Japan, Jun. 28, 1980, 55-90022; Jun. 28, 1980, 55-90023; Jun. 28, 1980, 55-90024

Int. Cl.³ E05F 3/08, 3/20

U.S. Cl. 16—54 **9 Claims**



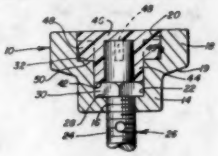
1. In a pivot hinge for supporting a door at its top end and having a door closing device easily and removably assembled thereto, wherein said pivot hinge has a first plate member including a first leaf portion to be secured to the upper portion of a door frame and a first disk portion projecting horizontally from, and integral with, said first leaf portion, and a second plate member including a second leaf portion to be secured to the top end of the door and a second disk portion projecting horizontally from, and integral with, said second leaf portion, said first and second plate members being connected to one another by a pivot pin at said first and second disk portions, and said door closing device having an outer sleeve in which a door closing mechanism is contained, said door closing device comprises said outer sleeve, an inner member being mounted in said outer sleeve to be rotatable in relation to said outer sleeve and being removably connected to said pivot pin, and a coil spring member disposed within said outer sleeve with the lower end of said spring being connected to said outer sleeve and with the upper end being connected to said inner member so that said coil spring member may be twisted by rotation of said outer sleeve together with said second plate member in relation to said inner member to provide the door closing torque, the improvement comprising said second disk portion being formed with a plurality of first axial grooves in the outer surface thereof, said outer sleeve formed with a plurality of second axial grooves on the inner surface of its top end portion to provide axial ridges between adjacent said second axial grooves, said outer sleeve non-rotatably connected to said second disk portion by mating said first axial grooves with said axial ridges, a supporting disk member superposed onto the upper surface of said second disk portion and being rotatable about said pivot pin, said supporting disk member formed with a plurality of first cut-away portions at its peripheral edge portion for mating with said axial ridges and thereby providing radial projections, said outer sleeve formed with an annular groove intersecting each axial ridge in the inner surface of the top end portion thereof so that each said axial ridge has a radial recess to permit said supporting disk member to rotate in said outer sleeve, said outer sleeve retained to said second disk portion by engagement of said radial projections with said radial recesses.

4,413,374

THREE PIECE KNOB ASSEMBLY INCLUDING A CAP

Irwin J. Ferdinand, Glencoe; Richard Sylvan, Gleaview, and Michael Peterson, Evanston, all of Ill., assignors to Hirsh Company, Skokie, Ill.

Filed Jun. 12, 1981, Ser. No. 273,203
Int. Cl.³ A47G 3/00
U.S. Cl. 16—121 5 Claims



1. A knob assembly comprising a knob having a top end and a bottom end, said knob defining an aperture including a first bore in said bottom end and including a second bore in said top end, said knob defining a seat around the upper end of said first bore and a shoulder around the lower end of said second bore;

said knob having an intermediate interior surface with a non-circular configuration defining an intermediate portion of said aperture connecting said first and second bores, said knob intermediate interior surface terminating at one end along the inner periphery of said shoulder and at the other end along the outer periphery of said seat;

nut means for mounting the knob assembly and having a configuration corresponding to, and disposed in, said intermediate aperture portion of said knob against said seat to prevent relative rotation between said knob and said nut means;

a cap having a cylindrical top end received in said second bore, said cap having a cylindrical bottom end with a bottom surface extending into said intermediate aperture portion for being positioned above said nut means in said intermediate aperture portion, said cap cylindrical bottom end having an outside diameter not exceeding the smallest cross-sectional dimension of said intermediate aperture portion, said cap top end defining a flange having an outside diameter about equal to that of said second bore, said cap further including a plurality of walls extending radially outwardly and depending from said cap flange, each said wall defining a bearing surface, said cap being disposed in said knob with said bottom surface of said cap bottom end engaging said nut means in said intermediate aperture portion and with said cap flange positioned in said second bore with said depending wall bearing surfaces supported on said shoulder; and

means for securing said cap to said knob whereby said cap positively holds said nut means in position within said knob.

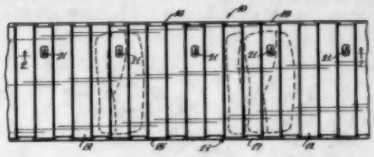
4,413,375

MEAT PROCESSING APPARATUS

John W. Cliff, Jr., Sioux City, Iowa, assignor to John Morrell & Co., Northfield, Ill.

Filed Aug. 17, 1981, Ser. No. 293,110
Int. Cl.³ A22C 17/02
U.S. Cl. 17—1 R 10 Claims

1. Meat processing apparatus comprising, a device with a surface for supporting a body of meat during cutting thereof, and means for holding said meat securely on said surface including an opening in said surface, and a hook positioned within said opening, means mounting the hook for movement between a raised position above the opening for impaling of a body of meat thereon and a lowered position within the opening and not above the top of the surface, said opening having an area greater than said hook whereby the edge of the opening is at a distance from the perimeter of the hook when the hook is in said lowered position to provide a space whereby a



portion of the meat is captured between the hook and the edge of said opening.

4,413,376

SUPPORT SHACKLE AND PRODUCT DROP MECHANISM

Richard D. Linville, P.O. Box 7, Pleasant Valley, Iowa 52767

Continuation of Ser. No. 227,140, Jan. 21, 1981, Pat. No. 4,372,009. This application Sep. 27, 1982, Ser. No. 424,322
Int. Cl.³ A22C 21/00
U.S. Cl. 17—44.1 5 Claims

1. A shackle for hanging a product from a pendant depending from an overhead conveyor, comprising

hook means adapted to be attached to said pendant for pivotable movement about an axis parallel to the direction of travel of said conveyor,

an elongated rigid support member depending from said hook means to one side of said axis,

said support member having product support means disposed at its lower end and extending laterally therefrom directly below said axis for supporting said product with the center of gravity of said shackle and said product disposed directly below said axis and offset from said support member.

4,413,377

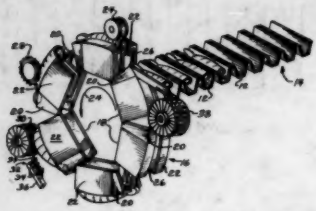
SHRIMP STRIPPER

Edmund D. Betts, Libertyville, Ill., assignor to Gregor Jonsson Associates, Inc., Highland Park, Ill.

Filed Aug. 26, 1981, Ser. No. 296,528
Int. Cl.³ A22C 29/02
U.S. Cl. 17—73 21 Claims

1. A shrimp processing machine comprising: a plurality of processing stations including a meat separating station for separating the shrimp meat from the shrimp shells; and carrier means for transferring the shrimp through said processing

stations, said carrier means being arranged to transfer the shrimp along a descending path through said meat separating station, and said meat separating station including a plurality of spike members, each said spike member including an elongate shaft portion and a tip portion, said tip portions being disposed at an angle from said shaft portions and pointing in a direction



generally opposite to the direction of shrimp transfer by said carrier means, and said spike members being arranged for reciprocal movement to a protracted position into a shrimp for penetrating the shrimp and coacting with said carrier means for separating the shrimp meat from the shrimp shells and to a retracted position for movement out of the shrimp meat for releasing the separated shrimp meat.

4,413,378

METHOD AND DRAFTING ARRANGEMENT FOR SPINNING MACHINES FOR PROCESSING A FIBER SLIVER

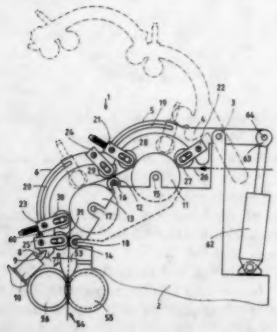
Gerhard Mandl, Bruetten; Giancarlo Mondini; Viktor Pietrini, both of Winterthur; Kurt Weber, Elgg, and Rudolf Wildbolz, Winterthur, all of Switzerland, assignors to Rieter Machine Works Limited, Winterthur, Switzerland

Filed Mar. 29, 1982, Ser. No. 362,873

Claims priority, application Switzerland, Apr. 6, 1981, 2309/81

Int. Cl.³ D01H *5/70, 5/74*

U.S. Cl. 19—258 **22 Claims**



1. In a method of processing a staple fiber sliver with a staple range between short to long staple fibers in a drafting arrangement for spinning machines, particularly for draw frames, wherein the staple fiber sliver is subjected to a high draft in drafting steps within drafting zones, the improvement which comprises:

positively deflecting the direction of movement of the fiber sliver per drafting step in front of and/or within the drafting zone, as the speed of the fiber sliver increases owing to thinning of the fiber sliver during the drafting process, in a manner such that the delivered fiber sliver, in relation to the inputted fiber sliver, is gradually subjected to a total positive deflection of substantially a 90° angle and that per positive deflection the angular acceleration ($r.\omega^2$) does not exceed a value of 400 m/sec^2.

4,413,379

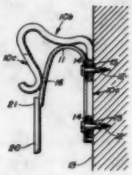
ONE HAND OPERABLE WALL MOUNTED SPRING CLIPS

Alan G. Evans, Woodhaven Dr., Star Rte. 5, La Plata, Md. 20646

Filed Nov. 20, 1981, Ser. No. 323,314

Int. Cl.³ A44B *21/00*

U.S. Cl. 24—3 J **3 Claims**



1. A clip for securing objects to a support surface, comprising:

a rigid means;

a spring means lying adjacent to said rigid means and having one leg biased toward one leg of said rigid means, said legs coacting with each other to form a length of a gripping jaw portion for holding an object placed therebetween, said leg of said spring means further being extended substantially beyond said leg of said rigid means and still further having a width substantially wider than said leg of said rigid means for the entire length of said jaw portion, whereby said leg of said spring means allows at least one finger of a user holding an object to slide continuously over the entire length of said leg of said spring means and simultaneously apply pressure to open said jaw portion and insert said object therebetween.

4,413,380

BINDING LOCKER

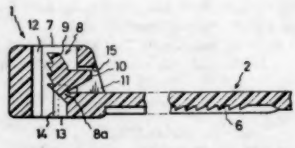
Tadashi Suzuki, Saitama, Japan, assignor to Satogosei Co., Ltd., Tokyo, Japan

Filed Aug. 20, 1980, Ser. No. 179,810

Claims priority, application Japan, Jan. 8, 1980, 55-679

Int. Cl.³ B65D *63/00*

U.S. Cl. 24—16 PB **1 Claim**



1. A binding locker for binding a plurality of objects together, said binding locker comprising:

(a) a band having a rack of engaging teeth formed on one surface thereof, said band having a leading end and a connecting end;

(b) a socket connected to said connecting end of said band and having a hole having an axis extending therethrough for receiving said leading end of said band, said socket further including an opening in communication with said hole and disposed at substantially right angles with said axis, said hole having a locking member projecting therein, said locking member having a plurality of locking

teeth for meshing with said engaging teeth when said band is inserted within said hole, whereby said leading end of said band and said socket are securely tied together to bind the plurality of objects;

(c) wherein said locking member has a projection disposed oppositely of said locking teeth and within said opening; and

(d) wherein said opening has an engaging surface and said locking member is secured to said socket in a manner to be movable as a force is exerted upon said band tending to withdraw it from said socket, whereby said projection is brought into contact with and is stopped by said engaging surface.

4,413,381

METHOD OF RETRIEVING AND SECURING ANCHORS, FISH TRAPS AND LOBSTER POTS

Robert J. Fidock, 49 Fourth St., Boolaroo, New South Wales, Australia

Filed Jul. 15, 1981, Ser. No. 283,670

Claims priority, application Australia, Oct. 30, 1980, PE6277

Int. Cl.³ F16G *11/00*

U.S. Cl. 24—131 C **5 Claims**

1. A device to aid in the retrieval of anchors and like articles from the bottom of a body of water, comprising guide means having an aperture through which a rope or chain connected to the anchor or like article may pass freely and without obstruction, connection means adapted to allow the device to be connected to floatation means, and retaining means defining an upwardly opening generally V-shaped slot through which the rope or chain may run before passing through the guide means as the rope or chain is drawn in, the retaining means being so disposed relative to the guide means that in use a knot or other obstruction on the rope or individual links of a chain may ride upwardly through the V-shaped slot as the rope or chain is drawn in under tension but will engage behind the slot if the tension in the rope or chain is subsequently released, said V-shaped slot having a first portion adjacent its base in which the angle between the edges of the slot is less than in a second portion more remote from the base.

4,413,382

ROPE CLAMP

Goetz Siegmann, 3382 Rosenstra 4, Kressbron, Fed. Rep. of Germany

Filed Jan. 26, 1981, Ser. No. 228,283

Claims priority, application Switzerland, Jan. 29, 1980, 725/80

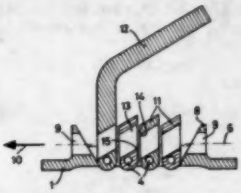
Int. Cl.³ F16G *11/10*

U.S. Cl. 24—132 R **4 Claims**

1. A clamp for securing and releasing a rope in a controlled fashion, the rope having an axis, the clamp comprising:

a base; and

a plurality of clampilng members each having an opening therein through which the rope may pass, each said opening having an axis as well as a forward and a rear edge zone, each clamping member being attached proximate one end thereof to said base for pivotable movement independent of the pivotable movement of the other clampling members in response to a force applied to one of said clamping members, the pivot axis of each clamping member being spaced from and parallel to the pivot axis of the other clamping members and lying in a common plane and also being transverse to and spaced from the axis of the rope, said clamping members having an open position in which each said clamping member lies in a plane at an oblique angle to the common axial plane containing the pivot axes of said clamping members for permitting the free passage of the rope through said openings;



wherein said openings are generally co-axial with one another and with the rope when said clamping members are in said open position; and

wherein said clamping members are relatively thick in relationship to their length, the thickness of said clamping members being measured generally along said axis of said opening therein, and the length thereof being measured generally along said oblique angle so that the rope is held in said clamp by coaction of the rear edge zone and forward edge zone of adjacent clamping members.

4,413,383

BUCKLES FOR HARNESSES

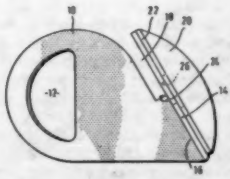
David N. Spalding, Woking, England, assignor to Britax-Excelsior Limited, Byfleet, England

Filed Jul. 22, 1980, Ser. No. 171,216

Claims priority, application United Kingdom, Jul. 28, 1979, 7926379

Int. Cl.³ A44B *11/00, 13/00*

U.S. Cl. 24—164 **1 Claim**



1. A buckle for a safety harness formed of first and second interlocking parts, wherein the first and second parts are identical and each part comprises a plate having means for connection to a harness strap at one end, an upstanding portion at its other end folded at right angles along an oblique fold line, a slot dimensioned to receive the upstanding portion of the other part extending from the end of the fold line nearer to the harness aperture to the mid point of the fold line, a protuberance on the side of the upstanding end portion remote from the harness connection means to provide an abutment surface on the level of the plate on the inside of the fold line and a hole through said upstanding end portion with its axis aligned with the end of the slot at the midpoint of the fold line whereby, if the two parts are interengaged with each upstanding portion received in the oblique slot of the other part, tension applied to the harness apertures pulls the two parts so that the ends of their slots abut and the two holes in the upstanding end por-

tions are aligned with one another to permit an object to the inserted therethrough to lock the two parts in engagement with one another.

4,413,384

LOCKING DEVICE FOR A SAFETY BELT

Jakob Lassche, 45, Wiesenwegle, 7230-Schramberg, Fed. Rep. of Germany

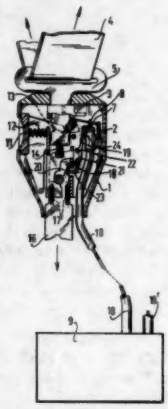
PCT No. PCT/NL80/00025, § 371 Date Apr. 2, 1981, § 102(e) Date Mar. 18, 1981, PCT Pub. No. WO81/00383, PCT Pub. Date Feb. 19, 1981

PCT Filed Jul. 29, 1980, Ser. No. 247,541

Claims priority, application Netherlands, Feb. 8, 1979, 7905948

Int. Cl.³ A44B *19/00*

U.S. Cl. 24—603 **4 Claims**



1. A locking device for a safety belt comprising a housing, a fastening member having a portion disposed in said housing for limited movement between retracted and extended positions with respect thereto, first spring means for urging said housing and fastening member to said retracted position, a lock bolt received in said housing for limited movement between locking and unlocking positions relative thereto, second spring means for urging said lock bolt toward said locking position, a key receivable in said housing and having a recess receiving said lock bolt in the locking position of the latter to prevent withdrawal of the key from said housing, means for effecting remote actuation of said lock bolt from said locking position toward said unlocking position whereby said key may be withdrawn from said housing, and blocking means operative when said fastening member and housing are in said extended position for blocking said means for effecting remote actuation and operative when said fastening member and housing are in said retracted position for unblocking said means for effecting remote actuation.

4,413,385

INVERSE CLEVIS SAFETY BELT BUCKLE

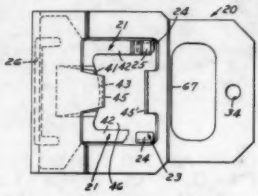
James A. Gavagan, Centerline, and William E. Brennan, Troy, both of Mich., assignors to Irvin Industries, Inc., Madison Heights, Mich.

Filed Apr. 13, 1981, Ser. No. 253,200

Int. Cl.³ A44B *11/26*

U.S. Cl. 24—230 A **14 Claims**

1. A safety belt buckle characterized by a sheet metal loop formed clevis having apertured ends for attachment to a first belt end, a fully surrounded slot in the clevis loop end extremity, a connector having an apertured end for attachment to a second belt end and a tongue insertable through said slot into close proximately with one side of said clevis, said tongue having an apertured end adapted for latch engagement, a latch having a reaction end extending beyond both extremities of said slot pivotally seated against slotted and unslotted portions of said loop end extremity within said clevis adjacent said slot having a latch projection engageable with said tongue aper-



tured end and said one side of said clevis, resilient means biasing said latch toward said engaging position deflectable in response to manual insertion of said tongue, and manually operable means to deflect said latch and resilient means to a tongue releasing position.

4,413,386

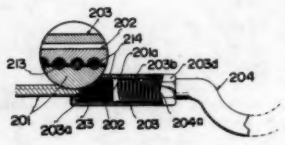
CONNECTING DEVICE FOR END OF ROPE OR BAR AND METHOD FOR PRODUCING THEREOF

Soichiro Sato, 3728 Oaza Nishihonjoji, Sanjo-shi, Niigata-pref., Japan

Filed Jan. 12, 1982, Ser. No. 338,979

Int. Cl.³ B66C *1/34*; F16G *11/14*

U.S. Cl. 24—230.5 R **6 Claims**



1. A system for connecting a rope or bar to a threaded bolt, comprising:

a rope or bar member;

a bolt member having a portion thereof externally threaded;

a tubular coupling member having one end thereof internally threaded for engagement with said externally threaded portion of said bolt member, the other end of said coupling member being provided with a radially inwardly extending annular shoulder portion; and

a sleeve member, having an outside diameter less than the inside diameter of said tubular coupling yet greater than the inside diameter of said annular shoulder portion, fixed onto said rope or bar member by means of a coil member, interposed between said rope or bar member and said sleeve member and embeddedly disposed within said rope or bar member and said sleeve member, and a malleable sleeve interposed between said coil member and said sleeve member, as well as within the interstices defined between successive spirals of said coil member so as to also be interposed between said rope or bar member and said sleeve member.

4,413,387

DRILLING APPARATUS

William Guier, 3100 E. 71st St., Tulsa, Okla. 74136

Filed May 22, 1981, Ser. No. 266,439

Int. Cl.³ E12B *3/00*

U.S. Cl. 188—67 **1 Claim**

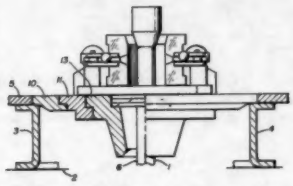
1. A spider with which to grip and suspend a drill string

within a well bore at predetermined times within the drilling and tripping sequences, including,

a drilling floor extending horizontally and over the well bore having an aperture concentric with the well bore,

a plurality of plate structures mounted over the floor aperture and having apertures of progressive sizes oriented concentric with the floor aperture and each other's apertures,

tab structures mounted at the edges of the plates to support and register the plates to maintain the concentricity of the plate and floor apertures,



a pair of jaws mounted to pivot on one of the upper plates and sized and arranged to have two positions which permit drill pipe to freely pass into and out of the well bore and alternatively grip the drill pipe at predetermined longitudinal locations as required to suspend the pipe during drilling and tripping sequences,

linkages connected between the pivoted jaws and the upper plate to actuate the jaws between their two positions,

hydraulic piston-cylinder structures mounted on the upper plate with their pistons connected to the linkages, and

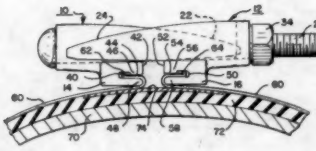
means for applying hydraulic fluid to the cylinders to move the pistons in their actuation of the jaws.

4,413,388

PIPE REPAIR CLAMP

Fuad Akhtar-Khavari, and Bernard J. Lobin, both of Texarkana, Tex., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed May 4, 1981, Ser. No. 260,226
Int. Cl.³ B65D *63/02*; F16I *55/16*
U.S. Cl. 24—279 **4 Claims**



1. A pipe clamp comprised of a pair of lugs each of which has a base with an inner edge, an axially extending recess in each base forming opposed jaws in each base and opening to respective inner edges of each base, said recess being comprised of a first portion of essentially rectangular cross section and remote from said inner edges, and a second portion extending from said first portion to the said inner edges, the radial dimension of said first portion being larger than the radial dimension of said second portion and extending radially outward beyond the radial dimension of said second portion, a band having surface and edge portions and extending between said lugs, an intermediate portion at said band is of a radial dimension snugly received in said second portion of each recess, enlarged portions on the ends of said band comprised of multiple layers of band having surface portions in substantial area contact with each other, formed by the end portions of the band being folded back on the band whereby the surfaces of layers which are in contact with each other are continuations of each other, said enlarged portions and said band being axially insertable and snugly received in respectively the first and second portions of said recesses in each of said lugs.

4,413,389

RELEASABLE BUCKLE STRUCTURE AND METHOD

Greg E. Lowe, Ogden, Utah, assignor to Lowe Alpine Systems, Inc., Lafayette, Colo.

Filed Jan. 19, 1981, Ser. No. 225,826
Int. Cl.³ A44B *11/28*
U.S. Cl. 24—312 **13 Claims**

1. A releasable buckle structure comprising:

an engaging member of a curved, planar configuration having attachment means defined at one end thereof and a release handle defined at the opposite end thereof, the engaging member further including a U shaped opening defined therein between the attachment means and the release handle portion, the U shaped opening defining an engaging projection centrally thereof,

a receiving member of a planar configuration having attachment means defined at one end thereof and a U shaped portion at the opposite end thereof, the U shaped portion having a receiving opening defined centrally therein,

the engaging projection of the engaging member being adapted to fit within the receiving opening of the receiving member with the side legs of the U shaped portion of the receiving member being adapted to fit within the side legs of the U shaped opening defined in the engaging member;

whereby the engaging member and receiving member may be releasably secured together with the engaging projection of the engaging member fitting within the U shaped portion of the receiving member, the structure further being releasable by pulling upon the release handle thereby rotating the engaging member and causing the U shaped portion of the receiving member to ride along the engaging projection to ultimately provide release by disengaging the U shaped portion through the bottom of the U shaped opening.

4,413,390

CASKET-PLACER AND CASKET-LOWERING APPARATUS

Herbert R. Blaese, and Christopher R. Loreac, both of Chicago, Ill., assignors to Wilbert, Inc., Forest Park, Ill.

Filed May 3, 1982, Ser. No. 374,100
Int. Cl.³ A61G *19/00*
U.S. Cl. 27—32 **37 Claims**

1. Apparatus for lowering a casket into a grave opening, or into the base of a burial vault in the grave opening, having four corner locations at the ground surface adjacent the said grave opening, comprising:

(a) a generally rectangular-shaped supporting frame adapted to be arranged over the said grave opening and including

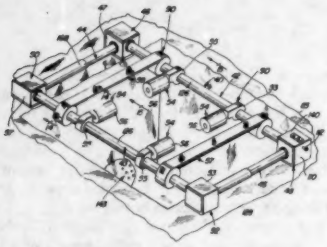
(1) a pair of generally parallel side rail members adapted to be arranged adjacent the sides of the said grave opening and including

a. a first side rail member; and

b. a second side rail member; and

(2) a pair of generally parallel end rail members adapted to be arranged adjacent the ends of the said grave opening including

a. a first end rail member; and
b. a second end rail member;
(b) a combination braking and power transmission head arranged at one corner of the said apparatus and at one of the said corner locations at the said ground surface of the said grave opening;
(c) means operatively interconnecting one of the said end rail members with one of the said side rail members and with the said power transmission means for rotational movement together;
(d) means operatively interconnecting the second one of said side rail members with the said power transmission means for rotational movement together;
(e) casket-placer and casket-supporting means carried by the said side rail members and movably downwardly thereon into the grave opening under the rotational movement of



the said side rail members for supporting a casket in position on the said apparatus above the grave opening for a graveside service and for lowering the casket into the grave opening after conclusion of the graveside service; and
(f) means including
(1) electronically controlled braking means in the said braking and power transmission head under the control of the said casket-placer and casket-supporting means and operable by the weight of a casket resting on the said casket-placer and casket-supporting means and the rotational movement of the said side rail members and one of the said end rail members for controlling the speed of rotation of the said casket-placer and casket-supporting means and the speed of the lowering movement of the casket into the grave opening.

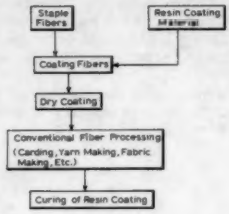
4,413,391

RESIN CONTAINING TEXTILES

Armen Renjilian, Colonie; Thomas H. Curry, Clifton Park, and Elizabeth Siracusano, Courtland, all of N.Y., assignors to Albany International Corp., Albany, N.Y.

Filed Aug. 2, 1982, Ser. No. 404,139
Int. Cl.³ D65N *71/00*
U.S. Cl. 28—166 **2 Claims**

1. A method of preparing textile fabrics from loose, staple textile fibers, which comprises;
coating the fibers with a film of a synthetic, cross-linkable, polymeric resin, said resin being one which will, following application, dry to a tack-free state which will not adhere to itself;
drying the film so that it is tack-free and will not adhere to itself;



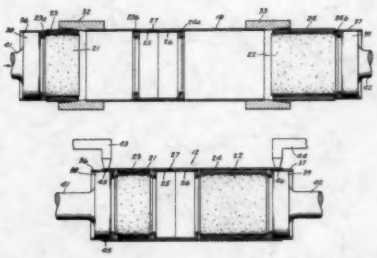
forming the coated fibers bearing dry film into a fabric form; and cross-linking the resin whereby the coated fibers in the fabric form remain unbonded to each other.

4,413,392

METHOD OF MAKING TWO-STAGE CATALYTIC CONVERTER

Junji Otani, Oomiya; Yasuo Ikenoya, Kawagoe, and Kanau Iwashita, Sakado, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 13, 1981, Ser. No. 292,618
Claims priority, application Japan, Aug. 22, 1980, 55-116230; Aug. 25, 1980, 55-116741
Int. Cl.³ B23P *15/00*; F01N *3/10*
U.S. Cl. 29—157 R **3 Claims**



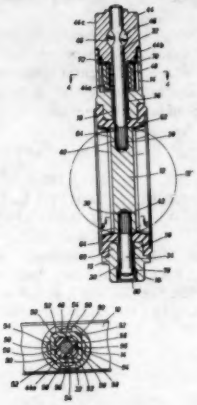
1. A method of assembling a catalytic converter having a cylindrical casing, catalyst elements, peripheral cushions about the catalyst elements and flanged sleeves to locate the catalyst elements in the casing, comprising the steps of
mounting tapered guide rings on opposite ends of the cylindrical casing;
simultaneously pushing the catalyst elements with the peripheral cushions thereabout and the flanged sleeves, placed outwardly of the catalyst elements, into the opposite ends of the cylindrical casing by means of opposed flanged pusher bars, the tapered guide rings and the action of the flanged pusher bars squeezing the peripheral cushions into the casing and around the catalyst elements;
removing the tapered guide rings; and
spot welding the flanged sleeves to the casing using the flanged pusher bars as welding electrodes in combination with additional welding electrodes outside of the cylindrical casing.

4,413,393

METHOD OF MANUFACTURING A VALVE ASSEMBLY

Petrus J. R. Schils, Breda, Netherlands, assignor to Keystone International, Inc., Houston, Tex.

Division of Ser. No. 887,513, Mar. 17, 1978, Pat. No. 4,275,867.
This application Jan. 22, 1981, Ser. No. 227,428
Claims priority, application Netherlands, Mar. 17, 1977, 7702881
Int. Cl.³ B23P 15/00; F16K 31/00
U.S. Cl. 29—157.1 R 13 Claims



1. A method of making a disc-type valve assembly comprising:

emplacing an integral positioning sleeve formed of resilient material generally coaxially within a radial passageway extending from a flowway in a tubular valve body, said sleeve and said valve body being formed with retainer formations wherein one of said sleeve and valve body is formed with radially projecting retainer formations and the other of said sleeve and valve body is formed with radially receiving retainer formations, said retainer formations being radially formed with respect to said sleeve, said sleeve being so emplaced as to interengage said retainer formations;

emplacing a disc-like valve element in the flowway of said valve body;

connecting a handle to a shaft member to form a rotating body;

inserting one end of said shaft member through said positioning sleeve in said radial passageway of said valve body and into engagement with said valve element and thereby wedging said positioning sleeve radially-with respect to itself-in tight prestressed relation between said valve body and said rotating body such that said rotating body is rotatably mounted with respect to said valve body and interengaging detent formations formed on said sleeve and rotating body wherein one of said sleeve and rotating body is formed with radially projecting detent formations and the other of said sleeve and rotating body is formed with radially receiving detent formations, said detent formations being radially formed with respect to said sleeve and said rotating body.

4,413,394

METHOD OF CONSTRUCTING A TUBE BUNDLE

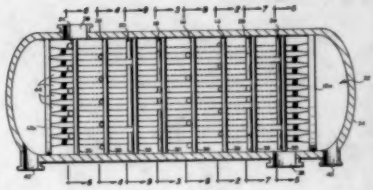
William M. Small, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 98,576, Nov. 28, 1979, Pat. No. 4,311,187.
This application May 18, 1981, Ser. No. 264,529
Int. Cl.³ B23P 15/26
U.S. Cl. 29—157.3 B 4 Claims

1. A method of constructing a tube bundle comprising:

(a) inserting a plurality of tubes into a ring having a plurality of first rods affixed thereto as parallel chords to form a plurality of parallel tube rows with the rows spaced from one another and extending parallel to said plurality of first rods, said first rods having a diameter less than the spacing between adjacent tube rows in the first plurality of parallel tube rows; and

(b) inserting a plurality of second rods parallel to said plurality of first rods between the parallel tube rows, said second rods each having a diameter greater than the spacing between adjacent tube rows in the first plurality of parallel tube rows, the diameter of a first rod plus the diameter of a second rod being about twice the spacing between adjacent tube rows in the first plurality of parallel tube rows, to wedge each row of at least a portion of said plurality of parallel tube rows between a first rod and a second rod.

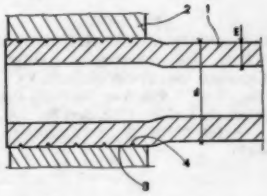


4,413,395

METHOD FOR FIXING A TUBE BY EXPANSION

Andre Garnier, Berlaimont, France, assignor to Vallourec SA, Paris, France

Filed Feb. 2, 1981, Ser. No. 230,531
Claims priority, application France, Feb. 15, 1980, 80 03348
Int. Cl.³ B21D 39/06, 39/10; B23P 15/26; F16L 39/00
U.S. Cl. 29—157.3 C 4 Claims



1. A method for fixing a thin tube by expansion, the tube having an outside diameter from about 19 to 32 mm, comprising:

(a) forming at least one bore in a metal plate to receive the tube, the inside surface of said bore having at least one annular projection with an axial length not greater than 1 mm when measured parallel to the axis of the bore, the annular projections being formed by displacing material on the bore surface before the end of the tube is set in position in the bore;

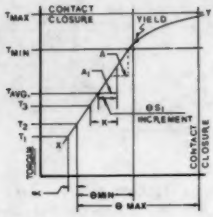
(b) inserting the tube, which has a wall thickness from about 0.25 to 0.50 mm and said outside diameter being less than the inside diameter of the bore, into said bore; and

(c) forcing the outer surface of the tube against the inside surface of the bore so that the annular projections are crushed on the inside surface of the bore to sealingly engage the outer surface of the tube.

4,413,396
MICROPROCESSOR CONTROL YIELD POINT TIGHTENING SYSTEM

William K. Wallace, Barneveld; David A. Giardino, New York, and Joseph R. Groshans, Deerfield, all of N.Y., assignors to Chicago Pneumatic Tool Company, New York, N.Y.

Filed Sep. 2, 1980, Ser. No. 183,424
Int. Cl.³ B23P *19/06;* G01L *5/24*
U.S. Cl. 29—407 2 Claims



1. A method for tightening a fastener to yield point comprising the steps of:

(1) rotating the fastener until a torque level T_3 is reached, which is the beginning of a yield point sensing operation;

(2) recording said torque level T_3;

(3) rotating the fastener through a predetermined angle θ_{sl} to arrive at torque level T_4;

(4) recording said torque level T_4;

(5) calculating the averaging torque between T_3 and T_4;

(6) determining the area under the torque-angle curve by summing measured torque valves within the angular increment of θ_{sl} less the product of average torque times θ_{sl};

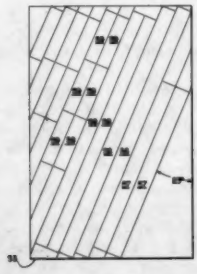
(7) advancing predetermined angle θ_{sl} one angular increment and repeating the procedure set forth in steps 4, 5 and 6, and calculating a quotient based on a last determined area to that of an initially determined area; and

(8) continuing the procedure set forth in step 7, until the ratio of the last determined area decreases from unity to a predesignated value at which point the tightening operation is terminated to avoid fastener torquing beyond yield point.

4,413,397
METAL DOOR AND LIGHT ASSEMBLY

H. Smith McKann, Fredericksburg, Va., assignor to General Products Company, Inc., Fredericksburg, Va.

Division of Ser. No. 178,493, Aug. 15, 1980, abandoned. This application Jun. 21, 1982, Ser. No. 390,351
Int. Cl.³ B23P *17/00, 6/00*
U.S. Cl. 29—416 2 Claims



1. A method of forming a door panel having an opening to receive a half-frame and muntins and of forming the half-frame and muntin members usable to retain a glass panel when assembled with a similar door panel and half-frame comprising the steps of

cutting a rectangular plate from the door panel to form an opening therein;

bending the edges of the door panel around the opening thus formed to provide an L-shaped retaining ledge at each side of the opening;

cutting the plate from the door panel along diagonal parallel lines to provide elongated strips of suitable width to provide a pair of horizontal frame members, a pair of vertical frame members, a pair of long muntins and six short muntins;

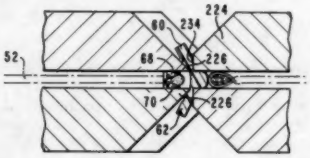
cutting the strips transversely into proper lengths for the frame and muntin members; and

bending the frame and muntin members into desired cross-sectional shapes whereby the door panel and frame and muntin members are provided with minimum material waste.

4,413,398
SLIDE FASTENER CHAIN WITH LEG REMANENTS AT GAP AND METHOD AND APPARATUS OF MANUFACTURE

Harry M. Fisher, Whitestone, and Stuart N. Fisher, Floral Park, both of N.Y., assignors to Talon, Inc., Meadville, Pa.

Filed Sep. 21, 1981, Ser. No. 304,450
Int. Cl.³ B21D *53/54;* A41H *37/06*
U.S. Cl. 29—410 10 Claims



1. A method of forming gaps in rows of coupling elements secured on respective inner edge portions of a pair of coplanar supporting tapes in a slide fastener chain, comprising the steps of

positioning a section of the slide fastener chain relative to first and second spaced cutting disks such that coupling elements at one end of the section of slide fastener chain are positioned between peripheral portions of the cutting disks,

rotating the cutting disks in opposite directions so as to engage cutting sections protruding radially from the periphery of the disks with coupling elements to sever portions of the engaged coupling elements and to pull the section of slide fastener chain between the disks, and

removing the severed portions of coupling elements from the slide fastener chain to form a gap in the slide fastener chain.

4,413,399
APPARATUS AND METHOD FOR PRECISELY POSITIONING AN OBJECT

David J. Crawford, Poughkeepsie, and Robert G. Meeker, La-Grangeville, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 9, 1981, Ser. No. 241,821
Int. Cl.³ B21D *39/03;* B23P *19/04*
U.S. Cl. 29—428 12 Claims

1. Apparatus for moving an object a fixed distance from an unknown initial position, and apparatus comprising:

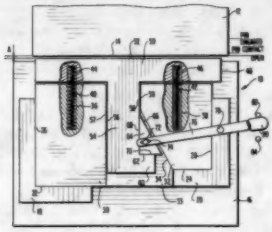
a support member;

a stop member fixed relative to said support member;

first means mounted for movement relative to said support member for engaging the object to be moved to impart force thereto;

at least one resilient bias spring;

second means mounted for movement relative to said support member for engaging said stop member and for maintaining said bias spring compressed between said first means and said second means, whereby force is imparted to said first means to cause it to engage and move said object an unknown distance to an initial position, said initial position being determined by resistance to move-



ment of the object which exceeds the force imparted by said bias spring; and

third means operatively associated with said first and second means for fixing the relative positions of said first and second means when said initial position is reached and then moving them together relative to said stop member through a fixed distance, whereby the object is moved said fixed distance from said initial position to a final position.

4,413,400

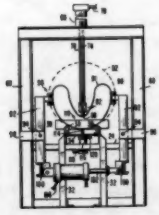
APPARATUS AND PROCESS FOR NESTING DRUM BODIES

Norman L. Fischell, 8 Foothill Dr., Kinnelon, N.J. 07405

Division of Ser. No. 229,133, Jan. 21, 1981. This application Dec. 9, 1982, Ser. No. 448,360

Int. Cl.³ B21D *39/00*

U.S. Cl. 29—515 **5 Claims**



1. A process for nesting a plurality of drum bodies to form a nested drum bodies assemblage which comprises:

(a) positioning a drum body in a deformation zone;

(b) exerting a linear deformation force upon said drum body and towards an axis of said drum body to form a deformed drum body;

(c) positioning another drum body about an end portion of said deformed drum body;

(d) removing said initial linear deformation force; and

(e) moving said another drum body to a point where said another drum body surrounds said deformed drum body.

4,413,401

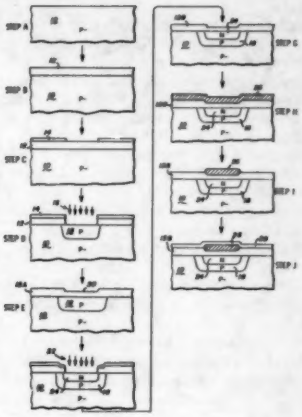
METHOD FOR MAKING A SEMICONDUCTOR CAPACITOR

Thomas Klein; Andrew G. Varadi, and Charles E. Boettcher, all of Saratoga, Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 59,637, Jul. 23, 1979, Pat. No. 4,290,186, which is a continuation of Ser. No. 788,872, Apr. 19, 1977, abandoned. This application Jul. 6, 1981, Ser. No. 280,984

Int. Cl.³ B01J *17/00*; **H01L** *21/265*

U.S. Cl. 29—571 **12 Claims**



1. A method for making a semiconductor capacitor device comprising the steps of:

forming a semiconductor region of one conductivity type within a higher resistivity semiconductor region of the same type conductivity;

forming a shallow semiconductor region of opposite conductivity type within said semiconductor region of one conductivity type located within said higher resistivity semiconductor region of the same one type conductivity;

forming an insulating layer on a surface of said semiconductor region of one conductivity type, said higher resistivity semiconductor region of the same one type conductivity and said shallow semiconductor region of opposite conductivity type;

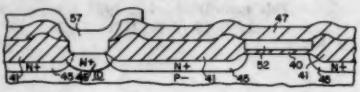
forming an electrically conductive electrode on a surface portion of said insulating layer located over said shallow semiconductor region of opposite conductivity type, said electrode being contoured to have an area that covers a major portion of the area of said shallow semiconductor region of opposite conductivity type; and

depositing an electrical contact to make an electrical connection to said shallow semiconductor region of opposite conductivity type, said electrically conductive electrode being one plate of the semiconductor capacitor device, said insulating layer being the dielectric of the semiconductor capacitor device, and said semiconductor region of opposite conductivity type being the other plate of the semiconductor capacitor device.

4,413,402
METHOD OF MANUFACTURING A BURIED CONTACT IN SEMICONDUCTOR DEVICE

Darrell M. Erb, Los Altos, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 22, 1981, Ser. No. 313,569
Int. Cl.³ H01L 21/265
U.S. Cl. 29—571 10 Claims



1. A method of manufacturing a semiconductor structure comprising:

forming a first oxide layer over a silicon substrate,

forming at least one polysilicon gate electrode on said first oxide layer,

implanting dopant ions into said substrate using said gate electrode as a mask so that said dopant forms a source/drain region in said substrate with respect to said electrode to create a MOSFET structure,

thickening said first insulating layer not covered by said gate electrode by oxidation to a thickness so as to surround said gate electrode,

etching said gate electrode so as to expose said first insulating layer therebelow,

etching said exposed first insulating layer to expose said substrate,

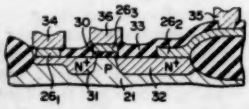
introducing a second dopant into said exposed substrate to diffuse through said substrate to said source/drain region,

forming a conducting lead over said thickened first insulating layer to contact said exposed substrate, whereby a buried contact to said source/drain region is formed.

4,413,403
METHOD OF PRODUCING SEMICONDUCTOR DEVICES

Shoji Ariizumi, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Division of Ser. No. 87,813, Oct. 24, 1979, abandoned. This application Feb. 23, 1982, Ser. No. 351,407
Claims priority, application Japan, Oct. 31, 1978, 53-134246
Int. Cl.³ H01L 21/22
U.S. Cl. 29—571 3 Claims



1. A method of producing a semiconductor device, comprising the steps of:

(1) forming a silicon oxide film on one main surface of a silicon semiconductor substrate of one conductivity type;

(2) selectively removing the silicon oxide film so as to provide openings partly exposing the surface of the substrate;

(3) forming a poly-Si film of the opposite conductivity type on the entire surface of the substrate by the chemical vapor deposition method;

(4) forming a silicon nitride film on the poly-Si film;

(5) selectively removing the silicon nitride film and the poly-Si film successively in a manner to form a pattern of the electrodes and wiring layers;

(6) removing the patterned silicon nitride film except the contact-forming portion in which a conductive layer is brought into contact with the underlying poly-Si film layer;

(7) selectively removing the exposed portion of the silicon oxide film so as to provide openings through which an impurity is diffused into the substrate for forming source and drain regions, the unremoved portion of the silicon oxide film constituting a gate oxide film;

(8) oxidizing the entire surface of the substrate so as to form a silicon oxide film covering the exposed portion of the substrate and the exposed portion of the poly-Si film;

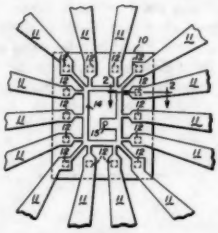
(9) removing the remaining silicon nitride film to form the contact-forming portion; and

(10) forming the conductive layer in contact with the poly-Si film via the contact-forming portion.

4,413,404
PROCESS FOR MANUFACTURING A TEAR STRIP PLANARIZATION RING FOR GANG BONDED SEMICONDUCTOR DEVICE INTERCONNECT TAPE

Carmen D. Burns, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 139,934, Apr. 14, 1980, Pat. No. 4,312,926.
This application Aug. 10, 1981, Ser. No. 291,197
The portion of the term of this patent subsequent to May 25, 1999, has been disclaimed.
Int. Cl.³ H01L 21/92, 21/96, 21/98
U.S. Cl. 29—590 5 Claims



1. A process for interconnecting an automatic assembly tape with a semiconductor device having a pattern of bonding pads thereon, said tape including a plurality of successive finger arrays each of which comprises a plurality of metal fingers extending inwardly to form an inner array that mates with said pattern of bonding pads, said process comprising the steps of:

forming a ring of metal integral with said fingers inside said inner array with each finger being connected to said ring;

forming a weakened region between each finger in said inner array and said ring;

bonding said fingers to said bonding pads at said inner region; and

removing said ring from said fingers thereby to leave said fingers attached to said semiconductor device.

4,413,405
METHOD FOR FITTING MAGNETIC WEDGES

Hiroshi Doke, Suzuka; Kazunobu Itomi, Yokohama, and Kenshi Ishihara, Mie, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

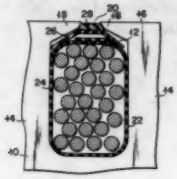
Filed Oct. 29, 1981, Ser. No. 316,530
Int. Cl.³ H02K 15/00
U.S. Cl. 29—596 1 Claim

1. A method for fitting magnetic wedges in stator slots in a stator core of an electric rotary machine, comprising steps of:

energizing a winding on the stator core of the electric rotary machine to produce magnetic flux passing through slot openings;

successively forcing the magnetic wedges in said slot openings while keeping said winding energized to maintain said magnetic wedges in predetermined positions in said slot openings by the agency of attraction of said magnetic flux; and

impregnating varnish into said stator core with said slot openings fitted with said magnetic wedges and with said winding



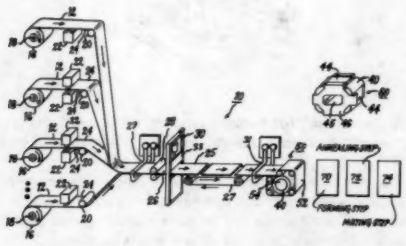
kept energized, thereby fixing said magnetic wedges to said predetermined positions in said slot openings.

4,413,406

PROCESSING AMORPHOUS METAL INTO PACKETS BY BONDING WITH LOW MELTING POINT MATERIAL

Moreland P. Bennett, Hickory, and Donald E. Ballard, Conover, both of N.C., assignors to General Electric Company, Philadelphia, Pa.

Filed Mar. 19, 1981, Ser. No. 245,402
Int. Cl.³ H01F *3/04*
U.S. Cl. 29—609 **16 Claims**



1. A method of forming an amorphous metal core for an electromagnetic device having relatively thick superimposed amorphous metal laminations comprised of a plurality of superimposed relatively thin amorphous metal sheets, said method comprising the steps of:

(a) providing a plurality of amorphous metal sheets of extended length and positioning said sheets adjacent each other so that immediately-adjacent sheets have confronting surfaces;

(b) applying to at least one confronting surface of each pair of immediately-adjacent sheets a deposit of metallic material having a melting temperature within the range of 50° to 350° C.;

(c) bringing together said plurality of amorphous metal sheets into a composite sheet having a thickness corresponding to the approximate thickness of one of said laminations;

(d) applying heat to said composite sheet so as to elevate its temperature to a value greater than the melting temperature of said deposit but less than the critical temperature of the amorphous metal sheets which would otherwise cause the amorphous metal to make a transition from its non-crystalline state to its crystalline state;

(e) allowing sufficient cooling of said composite sheet to cause the deposit to solidify and bond together the sheets of said composite sheet;

(f) cutting said composite sheet transversely of its length into packets of predetermined lengths corresponding to the desired lengths of said amorphous metal laminations, and;

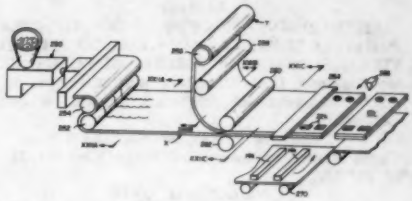
(g) arranging said packets into said superimposed laminations having a desired shape for said amorphous metal core.

4,413,407

METHOD FOR FORMING AN ELECTRODE-CONTAINING DEVICE WITH CAPILLARY TRANSPORT BETWEEN ELECTRODES

Richard L. Columbus, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 128,413, Mar. 10, 1980, Pat. No. 4,302,313, and a continuation-in-part of Ser. No. 59,816, Jul. 23, 1979, abandoned, which is a continuation-in-part of Ser. No. 954,689, Oct. 25, 1978, Pat. No. 4,233,029. This application Nov. 9, 1981, Ser. No. 319,568
Int. Cl.³ H01R *43/00*
U.S. Cl. 29—825 **5 Claims**



1. A method for making a device for the determination of activity of an ionic analyte of a liquid, said device including a pair of solid electrodes each constructed to generate therein an electrical potential that is proportional to the analyte activity present in a contacting quantity of said liquid, and flow control means for directing flow of respective quantities of two such liquids each to a different one of said electrodes and to a junction between said liquids, said control means including a member bridging and contacting said two electrodes; the method comprising the steps of

(a) providing a first sheet of formable insulative material having a width and length;

(b) forming in said sheet a plurality of adjacent channels extending generally the length of said sheet, a surface of one of said channels being configured to transport liquid;

(c) superimposing above said formed sheet a second insulative sheet a surface portion of which is channeled to transport liquid and is opposite to and spaced away from said one surface a distance effective to induce capillary flow of the liquid between said portion and said one channel surface;

(d) securing said second sheet to said first sheet to define a capillary liquid transport zone extending in the direction of the length of said first sheet; and, in any order,

(e) forming apertures extending all the way through said secured first and second sheets;

(f) severing individual units from said secured sheets; and

(g) completing the manufacture of a plurality of said devices by attaching a pair of said electrodes to an exterior surface of said first sheet of each of said individual units, each of said electrodes being aligned with one of said apertures.

4,413,408

METHOD FOR FABRICATING ELECTRODES

Olen L. Riggs, Jr., Bethany, Okla., assignor to Kerr-McGee Chemical Corporation, Oklahoma City, Okla.

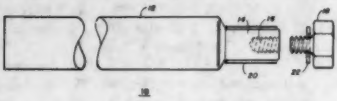
Filed Mar. 24, 1982, Ser. No. 361,582
Int. Cl.³ H01R *43/00*
U.S. Cl. 29—825 **3 Claims**

1. In the process of fabricating electrodes for use in cathodic protection systems installed in corrosive atmospheres such as heat exchangers, such electrodes employing titanium and platinum, the improvements which comprise:

a. mill one end of a titanium rod;

b. drill and tap a hole in the inner portion of said milled end;

c. slip fit a platinum cylinder about the milled end of said titanium rod and



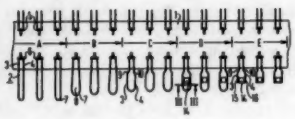
d. secure the platinum cylinder about the milled end of the titanium rod by inserting a titanium locking bolt into said drilled and tapped hole.

4,413,409

METHOD FOR ATTACHING AND FASTENING PARALLEL CURRENT LEAD WIRES TO OPPOSITE LATERAL SURFACES OF ELECTRICAL COMPONENTS

Erich Haidinger, Deutschlandsberg, Austria, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 9, 1981, Ser. No. 271,828
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1980, 3022590
Int. Cl.³ H01R 43/00
U.S. Cl. 29—856 3 Claims



1. Method for attaching and fastening parallel current lead wires to opposite lateral surfaces of an electrical component wherein current lead wires formed in one piece in the shape of a U are disposed in continuous sequence on a horizontally disposed bent-shaped conveyor-carrier of an automatically operating assembly system so that part of the two legs of the U-shaped structure and the part of the U-shaped structure connecting the legs protrude laterally beyond the edge of the conveyor-carrier, and an electrical component is clamped between the two legs and soldered thereto, which comprises sequentially the steps of:

(a) forming bends in the legs of U-shaped parallel current lead wires so as to adjust the mutual spacing of the legs in the part thereof projecting beyond the edge of the conveyor-carrier so that the spacing is smaller than is the length of the electrical component to be clamped between the legs, and the mutual spacing of the centers of the cross sections of the legs is greater than is the length of the electrical component,

(b) inserting the electrical component between the legs wherein said two legs each supports at least some vertically directed weight of said electrical component, in a direction perpendicular to the plane of the U-shaped structure and of the conveyor-carrier and spreading the legs apart due to the closer mutual spacing thereof than the length of the electrical component with resultant clamping of the electrical component between the legs,

(c) soldering the component to the legs,

(d) cutting off, in vicinity of the electrical component, the part of the U-shaped structure connecting the legs as well as the legs of the U-shaped structure, respectively, connected thereto, and

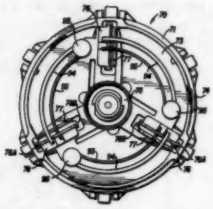
(e) testing the component with the current lead wires soldered thereto.

4,413,410

ELECTRIC SHAVER WITH ROTARY BLADE

Kiyotaka Otsuka, and Masao Tanahashi, both of Hikone, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Nov. 16, 1981, Ser. No. 321,749
Claims priority, application Japan, Nov. 29, 1980, 55-168833
Int. Cl.³ B26B 19/14
U.S. Cl. 30—43.6 6 Claims



1. A shaving unit for a rotary type electric shaver, comprising an inner cutter and a shaving head mounted over said inner cutter;

said inner cutter including a rotatable base having an upper surface, a lower surface, and a peripheral edge joining said surfaces, said base having receiving slits disposed radially about the axis of rotation of said rotatable base;

said inner cutter also including a cutter blade inserted in each receiving slit, each cutter blade having a cutting edge and a leg portion, said leg portion extending away from said cutting edge and terminating in a distal edge, said distal edge having a receiving notch and a receiving hole, said receiving hole being located closer to the axis of rotation of said rotatable base than said receiving notch;

said inner cutter also including a spring assembly for each said receiving slit, each spring assembly having at least first and second spring portions, one end of each spring portion being fixed to the lower surface of said rotatable base, the other end of said first spring portion engaging said receiving hole of said distal edge and exerting a downward force thereon, said second spring portion engaging said receiving notch and exerting an upward force thereon;

said shaving head including a thin, perforated comb having an upper surface and a lower surface;

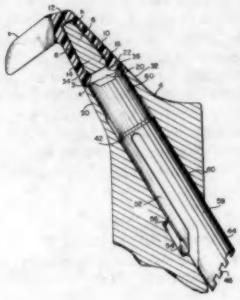
said cutting edge of each cutter blade bearing against the lower surface of said comb; the thickness of said first spring portion being less than said second spring portion, the upward force of said second leaf spring portion on said receiving notch thus being greater than the downward force of said first leaf spring portion on said receiving hole;

whereby a uniform contact pressure between the cutting edge of each said cutter blade against the lower surface of said comb is maintained along the entire cutting edge when said blades are rotated with said rotatable base during operation of said shaver.

4,413,411
RAZOR HANDLE

Robert A. Trotta, Pembroke, Mass., assignor to The Gillette Company, Boston, Mass.

Continuation-in-part of Ser. No. 352,146, Feb. 25, 1982. This application Mar. 19, 1982, Ser. No. 359,877
Int. Cl.³ B26B *21/14*
U.S. Cl. 30—85 **2 Claims**

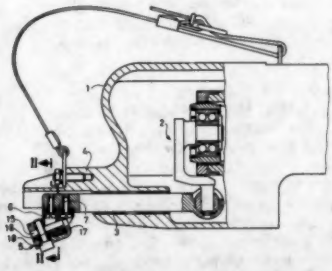


1. A razor handle comprising an elongated grip portion, a neck portion extending from one end of said grip portion and disposed at an angle to said grip portion, and a protrusion extending from an end of said neck portion remote from said grip portion, a connecting web joining said protrusion to said end of said neck portion, said connecting web being of lesser thickness than said protrusion, whereby to provide recess means between said end of said neck portion and said protrusion, said protrusion being in substantial alignment with said neck portion, and plunger means disposed in said neck portion, a first end of said plunger means being accessible from said grip portion and a second end of said plunger means being proximate said remote end of said neck portion, said plunger means being movable.

4,413,412
MOTOR-DRIVEN SCRAPING TOOL

Ludwig Wetzel, Pforzheim, Fed. Rep. of Germany, assignor to Firma Schmid & Wezel, Maulbronn, Fed. Rep. of Germany

Filed Aug. 3, 1981, Ser. No. 289,519
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1980, 3029193
Int. Cl.³ B23D *79/06*
U.S. Cl. 30—169 **13 Claims**



1. A motor-driven scraping tool, comprising a housing; drive means; an elongated supporting element having an axis and displaceable in an axial direction by said drive means, said supporting element having a free end portion; a receiving head for receiving a scraping member and arranged on said free end portion of said supporting element, said receiving head having two guiding faces for guiding said receiving head relative to said supporting member; and means for adjusting the play between said guiding faces of said receiving head and said supporting member, said adjusting means including at least one bendable tongue formed in said receiving head and forming one of said guiding faces, and at least one adjusting screw arranged to bend said one tongue relative to said supporting element.

4,413,413
CUTTING TOOL FOR USE ON PRINTED CIRCUIT BOARD WIRING

Samuel R. Romania, Phoenixville, and Frank L. Watson, Paoli, both of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Apr. 7, 1982, Ser. No. 366,354
Int. Cl.³ B26B *27/00*
U.S. Cl. 30—300 **8 Claims**

1. A tool for severing a printed lead from an electrically conductive pad surrounding a hole in a printed circuit board, comprising:

a substantially tubular body member having at one extremity thereof an annular cutting edge, said body member being tapered adjacent said last mentioned extremity, said body member comprising first and second contiguous bores of respective different diameters,

a spindle positioned within said body member along the central longitudinal axis thereof, said body member being rotatably disposed about said spindle, said spindle having a guide pin section at one extremity thereof, said spindle having a plurality of contiguous coaxial cylindrical sections, at least a first and second spindle section having diameters capable of being accommodated respectively by said first and second bores, a third of said sections contiguous with said second section but of lesser diameter than the latter being said guide pin section,

said last mentioned section protruding beyond the outermost portions of said cutting edge and having a shoulder enclosed by the latter and displaced a predetermined longitudinal distance from said outermost portions thereof,

said guide pin section being adapted to engage said hole to provide registration for said tool, the rotation of said body member effecting the severing of said printed lead by said cutting edge, said shoulder of said pin guide section being larger than said hole and controlling the depth of cut made by said cutting edge into the surface of said printed circuit board.

4,413,414

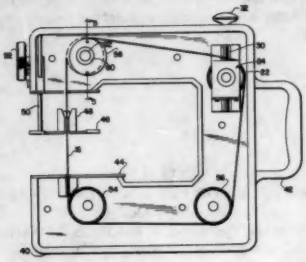
HAND HELD PORTABLE BAND SAW

Marion W. Strzalka, 230 E. Foxbury, Pomona, Calif. 91767

Continuation-in-part of Ser. No. 172,658, Jul. 28, 1980, abandoned. This application May 17, 1982, Ser. No. 379,069

Int. Cl.³ B27B *13/08*

U.S. Cl. 30—380 6 Claims



1. A band saw which comprises:

a generally U-shaped housing having confronting spaced end portions,

means for carrying an associated closed loop shaped saw blade, said carrying means being on said housing and supporting the blade with a blade portion extending between said housing end portions and with the blade supported for travel in a closed loop path, said means for carrying including a plurality of rollers, each roller being mounted on a respective shaft,

means for driving the blade on said means for carrying,

means for adjusting blade tension by varying the angular orientation of the axis of at least one of said rollers relative to a plane extending through the axial extent of the band saw blade, said means for varying comprising a rotatably mounted cylinder and a cylindrical recess in the cylinder, said recess being disposed in generally eccentric relationship to said cylinder, and

said means for adjusting includes bearing means at axially spaced points on said shaft mounting said one roller, each bearing means comprising a ball bearing and an annular member disposed between said rotatably mounted member and an outer race of the ball bearing, the outer race and rotatably mounted member having mutually engaging arcuate surfaces to effect self-alignment of the bearing and accommodate variation in orientation of said axis of said one roller.

4,413,415

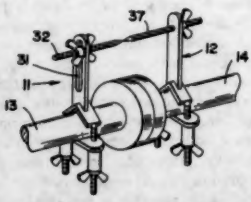
SHAFT ALIGNMENT TOOL

David T. Stovall, 265 Theobold La., Sacramento, Calif. 89511

Filed Jan. 26, 1982, Ser. No. 342,796

Int. Cl.³ G01B *3/30*

U.S. Cl. 33—181 R 1 Claim



1. An apparatus for aligning two rotatable shafts, comprising; a pair of jig assemblies, a pair of clamping means, each associated with one of said jig assemblies for releasably engaging one of the shafts, each clamping means including a pair of leg members extending generally linearly from a common vertex, and adapted to impinge tangentially on one of the shafts disposed therebetween, a pair of bracket members, means for joining each of said bracket members to one of said clamping means in releasable and adjustable fashion, including a pair of threaded shafts extending from the distal ends of said leg members to the respective bracket member, a pair of arms, each extending outwardly from one of said common vertices of one of said clamping means, each arm including a slot extending longitudinally therein, a pair of indicator members, each comprising a rod-like member having an axis extending generally parallel to the respective shaft, each indicator member including a portion extending through one of said slots and secured therein in longitudinally translatable fashion, means for aligning said indicator members in axial registration, said last mentioned means including a tapered, pointed end formed integrally on each of said indicator members and disposed in confronting relationship to the other, like pointed end.

4,413,416

MEASURING DEVICE

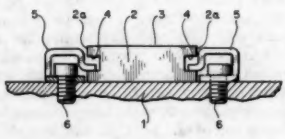
Alfons Ernst, Traunreut, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Feb. 26, 1981, Ser. No. 238,638

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1980, 3008384

Int. Cl.³ G01B *11/02*

U.S. Cl. 33—125 R 7 Claims



1. In a precision measuring device for measuring the position of a first component with respect to a second component, said measuring device comprising a bending resistant scale, the improvement comprising:

means, included in the scale, for defining a plurality of recesses in the scale; and

a plurality of resilient fastening elements for mounting the scale to a support surface defined by one of the first and second components, each of said fastening elements securely mounted to the support surface and positioned to engage a respective one of the recesses to apply a resilient mounting force to the scale acting substantially perpendicularly to the support surface, said mounting force of said fastening elements being sufficient to hold the scale in place, substantially without distorting the scale.

4,413,417

ADJUSTABLE ANGLE PLATE

Joseph R. Esposito, 304 Greenway Ave., Syracuse, N.Y. 13206

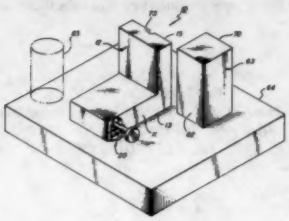
Filed Mar. 29, 1982, Ser. No. 363,157

Int. Cl.³ G01B *5/24*

U.S. Cl. 33—174 M 9 Claims

1. A toolmaker's square that includes a single piece body having a pair of cojoined legs, each leg having an accurately machined flat outer reference surface thereon with the surfaces meeting to form a corner having an inside angle that is slightly less than 90°, one of said legs forming the base of the square and containing a laterally extended slotted opening passing upwardly through the reference surface with the bottom of the opening being a flat tapered surface, a slide movably supported in the opening that has a tapered top surface that rides in contact against the tapered bottom surface of the opening to

raise and lower the lower section of the slide through the opening along a path of travel that is perpendicular to the reference surface of the base as the slide is moved laterally, said



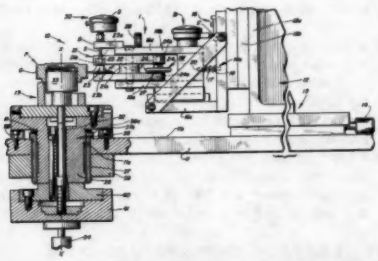
lower section of the slide containing a rest surface upon which the square can be seated and a drive means threaded into the base leg that is operatively connected to the slide for moving the slide laterally in said opening.

4,413,418

MEASURING APPARATUS

Wilbur F. Anderson, Nineveh, and Jon K. Griffith, Seymour, both of Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Apr. 5, 1982, Ser. No. 365,403
Int. Cl.³ G01B 5/00
U.S. Cl. 33—174 L **11 Claims**



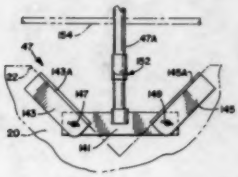
1. An apparatus for measuring the axial and radial runout of a groove formed in the periphery of a pulley, said apparatus comprising a base; a spindle mounted on said base and accommodating the pulley; a frame adjustably mounted on the base; a carriage mounted on said frame and adjustable independently thereof substantially axially and radially of the spindle axis; a carrier mounted on said carriage and adjustable independently thereof to a plurality of selected positions; a plurality of relatively spaced detector elements adjustably mounted on said carrier whereby a detector element is in close proximity to the pulley groove when said carrier is in each selected position; adjustable means coacting with said carriage and frame for positioning the detector element at the selected position whereby a portion of the detector element is in aligned engagement with side surfaces defining the pulley groove; and gauge means for simultaneously measuring axial and radial deflection of the groove-engaging detector element upon rotation of the spindle.

4,413,419

METHOD AND APPARATUS FOR REMOTE MEASURING

Nicholas A. Venuso, Hickory Hills, Ill., assignor to Metropolitan Sanitary District of Greater Chicago, Chicago, Ill.

Division of Ser. No. 166,372, Jul. 7, 1980, Pat. No. 4,367,652.
This application May 12, 1982, Ser. No. 377,503
Int. Cl.³ G01B 5/20
U.S. Cl. 33—174 G **4 Claims**



1. A notch measuring device for measuring the angle of a V-shaped notch in a top edge of a weir positioned in a manhole, handle means extending above the notch comprising:

a cross arm;

an elongated long rigid handle fixed to the cross arm;

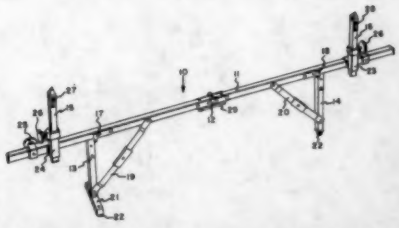
a pair of upstanding side arms pivotally attached at their bottom ends to the opposite ends of said cross arm for moving transversely into engagement with the weir at the notch to be measured, said side arms including respective flanges transversely bent relative thereto and extending backwardly therefrom for engaging the top edge portion of the weir defining the notch as said arms move into engagement with the weir to cause said arms to pivot relative to said cross arms to assume the angular relationship of the notch, said handle including an off-set portion adjacent to the cross arm to enable said arms to be slipped under the handle means extending above the notch.

4,413,420

VEHICLE GEOMETRY CHECKING APPARATUS

Ronald E. Hoffman, Uniontown, Ohio, and William K. Freed, Memphis, Tenn., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 6, 1982, Ser. No. 337,218
Int. Cl.³ G01B 5/25, 5/255
U.S. Cl. 33—180 AT **6 Claims**



1. A lightweight, collapsible apparatus for checking vehicle geometry comprising in combination:

(a) a pointer bar assembly used as a trammel and for checking toe measurements, comprising a horizontal bar member hinged at the center of its length, a means for vertical support attached by hinges to said horizontal bar member, and a plurality of pointers attached by means for sliding to said horizontal bar member, said pointers being perpendicular to said horizontal bar member in a direction opposite said means for vertical support; and

(b) an adjustable square bar assembly for providing a reference line perpendicular to a vehicle frame comprising a

straight bar member hinged at the center of its length, and a plurality of reference bars perpendicularly attached to said straight bar member so that T's are formed.

4,413,421

PICTURE HANGING LOCATOR

Nickolay Siniuk, 235 Genevieve, Windsor, Ontario, Canada

Filed Apr. 15, 1982, Ser. No. 368,730
Int. Cl.³ G01B 3/02
U.S. Cl. 33—180 R **2 Claims**

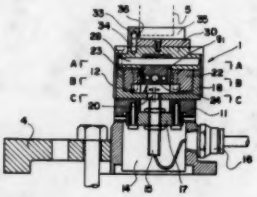
1. A device for locating the hanging location of a frame picture upon a wall, comprising: of a rubber or plastic covered wire which is wound at its top into a short coil having an inside diameter to permit the insertion therein of an index finger and by means of which said device is held against the wall; the wire of said coil continuing downwardly and transversely to the longitudinal axis of said coil into a straight shank which abuts the wall when the device is held against it; the free end of said shank terminating in a hook, upon which the frame of said picture is freely suspended, so that after locating where the picture should be permanently hung, the picture is removed, exposing the hook, the bottom of which is marked upon the wall as the spot where the nail or hanger is attached to the wall.

4,413,422

APPARATUS FOR DETECTING THE POSITION OF A MACHINE TOOL SPINDLE

Koichiro Kitamura, Takaoka, Japan, assignor to Kitamura Machinery Co. Ltd., Takaoka, Japan

Filed Nov. 5, 1981, Ser. No. 318,364
Claims priority, application Japan, Nov. 10, 1980, 55-156987
Int. Cl.³ G01B 7/00, 11/00
U.S. Cl. 33—185 R **5 Claims**



1. An apparatus for detecting the position of a spindle of a machine tool comprising:

a base;

a proximity switch fixedly mounted on said base;

a proximity member slidably mounted on said base and having a sensing hole formed therein adjacent to said proximity switch;

a contactor coupled to said proximity member; and means effective when said contactor and said proximity member are displaced for returning said contactor and said proximity member to original positions thereof;

said base being adapted to be fixedly mounted on a table of said machine tool; and

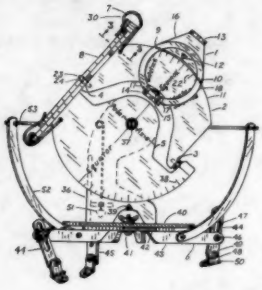
said contactor being formed with a right-angle x-direction and y-direction contact surface adapted for contact with measuring means mounted on the spindle of said machine tool.

4,413,423

SUN TRACKING DEVICE

Ralph B. Galvin, 2350 E. 91st St., Indianapolis, Ind. 46240

Filed Aug. 20, 1981, Ser. No. 294,493
Int. Cl.³ G01C 1/00
U.S. Cl. 33—268 **10 Claims**



1. A sun tracking device, comprising:

a. a support means rotatable about a horizontal axis;

b. a circular segment mounted on said support means so as to rotate about a principal axis parallel to the face plane of the segment and perpendicular to the said horizontal axis;

c. a solar ray directed assembly straddling the said circular segment with means for rotating the assembly about an axis through the center of curvature of the circular rim of the segment and normal to the said face plane of the segment;

d. a solar ray incident member fixed to the outer end of the said solar ray directed assembly and extending laterally on both sides of the said face plane of the segment, said solar ray incident member characterized by a replica of the sun, a disc with apertures for receiving the sun's rays, and a lens for concentrating the sun's rays;

e. a time element mounted on the said support means, centered and rotatable on the said principal axis of the said circular segment, and having a generally circular rim form as characterized by a disc, a clock dial, and a toothed gear, and;

f. a holding means for adjustably positioning the said circular segment relative to the said time element.

4,413,424

AZIMUTH DETERMINATING APPARATUS

Hiroaki Sasaki, Chiryu; Testuya Inoue, Kariya; Yoshiharu Mineo, Kariya; Sei Iguchi, Kariya; Kazuhide Makita, Nagoya; Hiroshi Arai, Toyota; Hajime Itoh, Aichi; Hisatoshi Ohta, Toyota; Masahiro Inazu, Toyota, and Akira Kawahashi, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

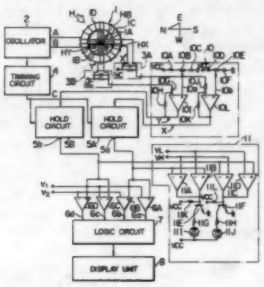
Filed Oct. 16, 1981, Ser. No. 312,075
Claims priority, application Japan, Oct. 20, 1980, 55-150199[U]
Int. Cl.³ G01C 17/30; G01R 33/02
U.S. Cl. 33—361 **2 Claims**

1. An azimuth determining apparatus including an azimuth sensor provided on a moving body for sensing a direction of said moving body relative to earth's magnetism to produce two

direction component signals crossed at the right angles and means for comparing the two direction component signals from said azimuth sensor with two reference signals, respectively, to display a moving direction of said body, the apparatus comprising:

an adjusting circuit including a first inverting amplifier having a non-inverting input receiving a reference signal from first adjusting means and an inverting input receiving one of said detection signals from said azimuth sensor, and a second amplifier having a non-inverting input receiving a reference signal from inverting second adjusting means and an inverting input receiving the other detection signal from said azmuth sensor; and

an indicating circuit including a first comparator having an inverting input receiving the output signal from said first inverting amplifier and a non-inverting input receiving a



first predetermined reference signal, a second comparator having an inverting input receiving a second predetermined reference signal and a non-inverting input receiving the output signal from said first inverting amplifier, a third comparator having an inverting input receiving the output signal from said second inverting amplifier and a non-inverting input receiving said first predetermined reference signal, a fourth comparator having an inverting input receiving said second predetermined reference signal and a non-inverting input receiving the output signal from said second inverting amplifier, first light emitting means responsive to the output signals of said first and second comparators for indicating correct adjustment of said one direction component, and second light emitting means responsive to the output signals of said third and fourth comparators for indicating correct adjustment of said other direction component.

4,413,425

METHOD FOR THERMAL/VACUUM DRYING A WET WEB OF MATERIAL

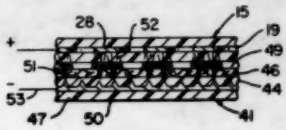
James T. Candor, 5440 Cynthia La., Dayton, Ohio 45429

Continuation-in-part of Ser. No. 174,886, Aug. 4, 1980, Pat. No. 4,319,407, which is a division of Ser. No. 85,216, Oct. 16, 1979, Pat. No. 4,236,317, which is a continuation-in-part of Ser. No. 849,097, Nov. 7, 1977, Pat. No. 4,189,845, which is a continuation-in-part of Ser. No. 809,945, Jun. 24, 1977, Pat. No. 4,135,307, which is a division of Ser. No. 695,092, Jun. 11, 1976, Pat. No. 4,050,162, which is a continuation-in-part of Ser. No. 541,218, Jan. 15, 1975, Pat. No. 3,977,937, which is a continuation-in-part of Ser. No. 405,023, Oct. 10, 1973, Pat. No. 4,060,449. This application Dec. 14, 1981, Ser. No. 330,240

Int. Cl.³ F26B *3/34*; B01D *57/02*

U.S. Cl. 34—1 **5 Claims**

1. In a method for thermal/vacuum drying a wet web of material, said method comprising the steps of sandwiching a part of said wet web with a porous web between a pair of moving heat conductive layers, heating the layer adjacent said wet web, and cooling the layer adjacent said porous web to thereby cause the particles of liquid of said wet web to be vaporized by said heated layer and be condensed back to particles of liquid by said cooled layer while said layers and said webs are moving together in a sandwiched relation, the



improvement comprising the step of imposing an electrostatic field means at least through part of said moving sandwich of said webs by charging at least one of said layers to augment said thermal/vacuum drying of said wet web while said part is disposed between said layers.

4,413,426

METHOD AND APPARATUS FOR DRYING MOIST EXHAUST AIR FROM ONE OR MORE BULK MATERIAL DRYING HOPPERS

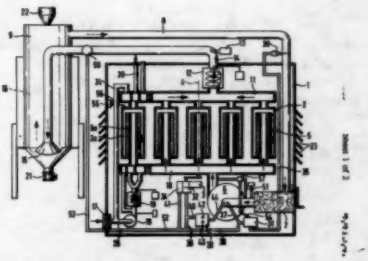
Roderich W. Gräff, 1311 Pine Valley Ct., Ann Arbor, Mich. 48104

Filed Dec. 1, 1981, Ser. No. 326,223

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1981, 3110873; Aug. 8, 1981, 3131471

Int. Cl.³ F26B *3/14*

U.S. Cl. 34—27 **28 Claims**



1. In a method of drying exhaust air from one or more bulk material drying hoppers, comprising the steps of conveying exhaust air from a bulk material drying hopper through at least one chamber filled with an absorbing medium and feeding the air back to the drying hopper in a closed circuit, the chamber being regenerated at intervals in a second air circuit, the improvement comprising the step of controlling the amount of the air throughput through the bulk material drying hopper as a function of the temperature of the exhaust air from the drying hopper.

4,413,427

FUEL CONTROL SYSTEM FOR DRYER

Joseph A. Villalobos, Mahwah, and Triffin G. Payhojos, East Brunswick, both of N.J., assignors to AER Corporation, Ramsey, N.J.

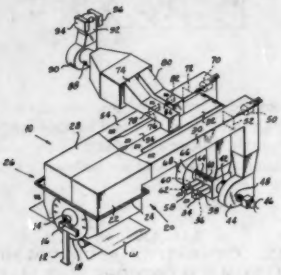
Filed Jul. 29, 1981, Ser. No. 288,124

Int. Cl.³ F26B *21/08*

U.S. Cl. 34—46 **1 Claim**

1. In a dryer system, an exhaust duct and a plurality of dryer sections each comprising a fresh air supply and a recirculating air system and a burner for directly heating drying air and a removal duct though which moisture-laden air is carried away

from each of the sections at a temperature in excess of 250° F., said system including a bypass duct section, means connecting one end of said bypass duct section to said exhaust duct, means for selectively directing air from said section removal ducts into the other end of said bypass duct, a radiant energy source located outside said bypass duct section, means for directing radiation from said source into said bypass duct section to subject moisture-laden air therein to the action of said radiation



to produce resultant radiation, means located outside said bypass duct section for detecting said resultant radiation and means responsive to said detecting means for controlling the proportion of recirculated to fresh air in the removal duct connected to the other end of the bypass duct by regulating the fresh air introduced into each of the sections through said fresh air supply to thereby regulate the moisture content of the air in said last-named duct and in said dryer sections.

4,413,428

HAIR DRYER CASING

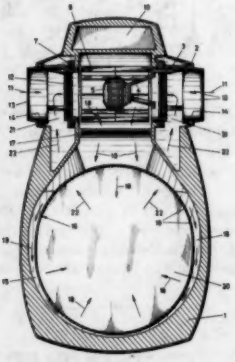
Johannes P. Roos, Medemblik, Netherlands, assignor to Indola Cosmetics B.V., Rijswijk, Netherlands

Filed Jan. 19, 1978, Ser. No. 871,085

Claims priority, application Netherlands, Jan. 21, 1977, 7700652; Jan. 21, 1977, 7700654

Int. Cl.³ A45D *20/22*

U.S. Cl. 34—100 **1 Claim**



1. A hair drying apparatus of the type comprising a double-walled casing having an outer wall and a perforated inner wall separated by an intermediate space from the outer wall and partly enclosing an inner space for receiving the head of a person whose hair is to be dried, a supporting member pivotally connected to said casing and means, including a motor-driven fan and air-heating means, for producing a flow of heated air into said intermediate space and through the perforations of said inner wall into said inner space where, in use, it will impinge on the hair to be dried, said supporting member comprising a bow-shaped member having tubular end parts which are axially aligned with each other and disposed substantially perpendicularly to the parts of said casing adjoining said bow-shaped member, said bow shaped-member including pivot means for directly pivotally connecting the tubular end parts of said bow-shaped member to said casing so that said casing is pivotally adjustable about only one axis coincident with the center-line of the motor-driven fan, said motor-driven fan being fixed to said bow-shaped member so as to be supported thereby in a position between the tubular end parts, said motor-driven fan having a drum-shaped rotor which operates as a radial blower so as to draw air from the outside of the double-walled casing through the tubular end parts of the bow-shaped members, said tubular end parts being provided with filters which are positioned in the axial inner end of each of said tubular end parts for filtering the air drawn in through the same, and said inner space which is partly enclosed by said inner wall of said double-walled casing being connected through openings in the walls of the tubular end parts with those portions of the interiors of said tubular end parts which are located on that side of the respective filter which is remote from the fan, so that, in use, the fan will draw not only fresh air from outside the casing, but also recirculated air from said inner space for delivery through the filters into the intermediate space between the walls of the double-walled casing.

4,413,429

MOLDED FOOT BED

Roy J. Power, Berwyn, Pa., assignor to Power-Soler, Inc., Wetumpka, Ala.

Filed Jun. 22, 1981, Ser. No. 275,662

Int. Cl.³ A43B *13/38*

U.S. Cl. 36—44 **8 Claims**

1. A moldable foot bed for insertion and wearing in a shoe comprising a laminate having three layers; a bottom or base layer comprising a foam rubber having a density ranging from about 10 to about 25 pounds per cubic foot and being heat deformable at a molding temperature ranging from about 130° to about 170° F. to take a permanent compression set of at least about 50% under the weight of an adult human, the thickness of said base layer ranging generally between 3/16 inches and 3/8 inches; an intermediate layer of a foam rubber which is highly resistant to permanent deformation under pressure at temperatures below about 170° F., said intermediate layer displaying a resiliency as determined by the Bayshore Rebound method of at least about 50%, having a minimum elongation of about 200%, and having a thickness approximately half that of said base layer, and a top or face layer thinner then said intermediate layer and having a resilience and elasticity substantially less than said intermediate layer; said face layer displaying a maximum compression set of less than about 20% at said molding temperature.

4,413,430

SKATE BOOT INSERT

Dennis N. Brown, 1091 Fir Ave., Blaine, Wash. 98230

Filed Oct. 30, 1981, Ser. No. 316,721

Int. Cl.³ A43B *13/38, 7/22, 5/04*

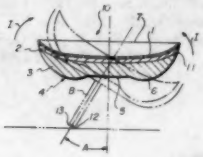
U.S. Cl. 36—44 **17 Claims**

1. An insert adapted for insertion and wearing use within a boot or the like, comprising in combination;

a blank having a top layer with its upper surface generally contoured to conform to the plantar surface of a person's foot,

a lower layer having a bottom face provided with a recess

substantially extending rearwardly from the metatarsal to the calcaneal area of the foot, the metatarsal area itself of



uniform thickness along an entire metatarsal head area and transverse to said recess.

4,413,431

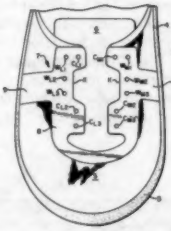
ATHLETIC SHOE UPPER CONSTRUCTION

Peter R. Cavanagh, Pine Grove Mills, Pa., assignor to PUMA-Sportschuhfabriken Rudolf Dassler KG, Herzogenaurach, Fed. Rep. of Germany

Filed Jun. 11, 1982, Ser. No. 387,668

Int. Cl.³ A43B *5/00, 11/00*

U.S. Cl. 36—114 **8 Claims**



1. An athletic shoe upper construction comprising a vamp with an elongated throat opening, and a one-piece reinforcement of non-stretchable material having a lacing hole reinforcing portion, a medial reinforcing portion, and a lateral reinforcing portion; wherein said lacing hole reinforcing portion is secured to said vamp adjacent to and surrounding said throat opening and is provided with a plurality of pairs of lacing holes, the holes of each pair of holes being located on opposite sides of said throat opening; wherein said medial reinforcing portion is an elongated strip extending from said lacing hole reinforcing portion to the featherline of said vamp in the mid-tarsal region of the medial side of said vamp, and is of a width and location with respect to the medial side lacing holes of an adjacent two of said pairs of lacing holes sufficient to span same; wherein said lateral reinforcing portion is an elongated strip extending from said lacing hole reinforcing portion to the featherline of said vamp in the mid-tarsal region of the lateral side of said vamp, and is of a width and location with respect to the lateral side lacing holes of said adjacent two pairs of lacing holes sufficient to span same; and wherein said pairs of lacing holes comprise widely-spaced pairs of holes and closely-spaced pairs of holes, the holes of the widely-spaced pairs of holes being located closer to said featherline than the holes of the closely-spaced pairs; and wherein the pairs of holes spanned by said medial and lateral reinforcing portions are widely-spaced pairs of holes.

4,413,432

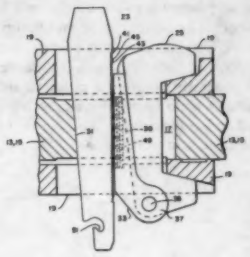
WEDGE AND CLAMP LOCKING SYSTEM

Robert S. Bierwith, 145 Basinside Way, Alameda, Calif. 94501

Filed Jul. 9, 1982, Ser. No. 396,763

Int. Cl.³ E02F *9/28*

U.S. Cl. 37—142 A **5 Claims**



1. An improved wedge and clamp locking system wherein the interaction between the wedge and clamp to effect the locking action is to expand the physical occupation of a confined space as the wedge is forced against the clamp into the space occupied by the clamp, the improvement comprising

a detachable bearing surface disposed on said clamp, the bearing surface being that portion of the clamp against which the wedge slides as it is forced into the space occupied by the clamp,

a locking surface disposed on said wedge for engaging said detachable bearing surface on said clamp, and

an interlock disposed on the detachable bearing surface of said clamp for engaging the locking surface of said wedge, said interlock permitting only unidirectional movement of said wedge into the space occupied by the wedge and clamp so as to tighten the locking system as the wedge is forced into the space, said interlock being unlockable by detaching said bearing surface from said clamp and removing said wedge and said bearing surface from said confined space as a unit in the interlocked relationship until the wedge and the detachable bearing surface are clear of the confined space and can be separated and disengaged.

4,413,433

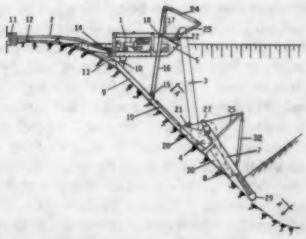
APPARATUS FOR EXTRACTING MUDDY MATERIALS AND FEEDING THEM TO A TREATMENT STATION

Jean-Claude M. Duverne, 18, rue des Processions, F91310 Montlhery, Linas, France

Filed Dec. 4, 1981, Ser. No. 327,581

Int. Cl.³ E02F *3/06*

U.S. Cl. 37—190 **5 Claims**



1. Apparatus for extracting and feeding muddy materials to a remote treatment station and operable progressively from firm ground toward basins or deep morasses with steep sloping

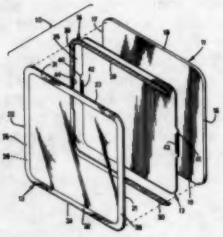
banks comprising at least one extraction and excavating screw, bucket means for receiving the materials extracted by said screw, elevator means for removing said extracted materials from said bucket means, pump means for receiving said materials from said elevator means and propelling it to toward said treatment station, wherein said pump means is supported on a foundation, said foundation supporting in a hinging manner at one end the corresponding end of said pump means and at the other end in a hinging manner a gantry, said gantry and said pump means being operably connected to maintain said pump means in a generally horizontal position, and said foundation being restrained from sliding by anchoring means secured in firm ground and comprising a cable, cable hoist and a control winch secured to said pump means.

4,413,434

SUBSURFACE SIGN ASSEMBLY

John G. Rupert, 795 Frederica St., Apt. No. 1, Atlanta, Ga. 30306, and Kenneth N. Jensen, 444 Sterling St., NE., Atlanta, Ga. 30307

Filed May 28, 1982, Ser. No. 382,963
Int. Cl.³ G09F 3/18
U.S. Cl. 40—10 R 10 Claims



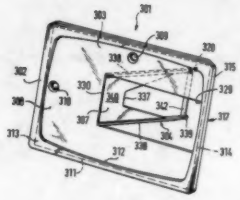
1. A subsurface sign assembly comprising a back plate for mounting to a wall surface or the like, a transparent face plate, double face adhesive strip material contacting one surface of said back plate and the facing surface of said transparent face plate for mounting said face plate to said back plate and maintaining said face plate in spaced relationship with said back plate, said adhesive strip material being arranged between said back plate and said face plate to form a sign plate space between said back plate and said face plate, with said sign plate space open along at least one edge portion of said sign assembly, a sign plate bearing indicia on at least one surface thereof and positioned in said sign plate space with the surface bearing the indicia facing said transparent face plate, whereby said sign plate can be inserted between and withdrawn from between the back plate and the face plate through the open edge portion of the sign assembly, the surface of said face plate which faces said back plate including a layer of opaque material applied thereto at its perimeter which extends inwardly from the edges of said face plate and which overlies said adhesive strip and hides said adhesive strip from view through said face plate, and wherein the edge portions of said sign plate are juxtaposed the opaque material and the opaque material hides the edge portions of said sign plate from view through said face plate.

4,413,435

PICTURE VIEWER

Max Baur, Kollbrunn, Switzerland, assignor to Licinvest AG, Chur, Switzerland

Division of Ser. No. 943,471, Sep. 18, 1978, Pat. No. 4,241,529.
This application Dec. 29, 1980, Ser. No. 221,165
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1977, 2742351; Oct. 7, 1977, 2745214; Dec. 16, 1977, 7738461[U]
Int. Cl.³ A47G 1/06; G09F 1/12
U.S. Cl. 40—155 8 Claims



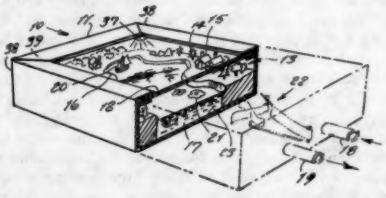
1. A picture carrier having a frame that defines a viewing aperture for the picture and means to support the front side of the picture adjacent the aperture, and having a rear wall that has a support face for the rear side of the picture, there being a gap formed between the rear wall and the frame joined therewith and extending at least partially around the frame, and a transport slider slidably mounted in a recess in the rear of said frame and having a retentive covering for engaging the picture in such a manner that the picture will be carried along with said transport slider, the slider yieldably mounting the retentive covering relative to the gap so that upon engagement through said recess of said transport slider, the retentive covering is brought into engagement with the rear side of the picture at an area of the picture against which the front side of the picture is supported for sliding the picture relative to said carrier frame.

4,413,436

AQUARIUM WITH SIMULATED STREAM FLOW

Michael L. Ward, c/o George Spector 3615 Woolworth Bldg. 233 Broadway, and George Spector, c/o Michael L. Ward 3615 Woolworth Bldg. 233 Broadway, both of New York, N.Y. 10007

Filed Jun. 1, 1982, Ser. No. 384,093
Int. Cl.³ G09F 1/12
U.S. Cl. 40—160 3 Claims

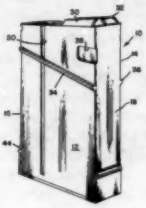


1. A display device, comprising in combination, a case, a transparent window on top of said case, and a display inside said case, said display including a miniature landscape together with a lake comprised of a depression with water therein, said water circulating through said case from an outside source via an inlet and said outlet, floating objects upon the surface of said water, an transparent barriers in said lake for controlling circulating of said water, said inlet and outlet located adjacent the bottom of said case in combination with means responsive to inlet flow providing variations in the flow pattern through the device.

4,413,437
CARTRIDGE MAGAZINE

Robert A. Anderson, 19009 Laurel Park Rd., Sp. 75, Dominguez Hills, Calif. 90220

Filed Jun. 15, 1981, Ser. No. 273,869
Int. Cl.³ F41C 25/02
U.S. Cl. 42—50 3 Claims

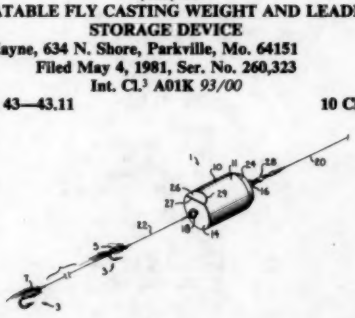


1. A cartridge magazine comprising:
a substantially rectangular shaped casing having a removable base portion at the bottommost portion,
a coiled spring located within said casing and supported at one end by said removable base portion, and
a follower attached to the other end of said spring to prevent fore and aft motion of the follower,
said spring formed to physically contact the follower in the fore and aft portions of the spring attachment point thereby preventing the follower from pivoting about the spring and allowing the full spring at all times to urge cartridges in an upward direction without jamming,
said follower has a tongue portion with an opening located below the bottommost portion of the follower and the end of the spring is lower than the highest coiled loop and is adapted to be inserted in said opening thereby attaching said follower to said spring and preventing fore and aft motion of the follower.

4,413,438
FLOATABLE FLY CASTING WEIGHT AND LEADER STORAGE DEVICE

Hank Hayne, 634 N. Shore, Parkville, Mo. 64151

Filed May 4, 1981, Ser. No. 260,323
Int. Cl.³ A01K 93/00
U.S. Cl. 43—43.11 10 Claims

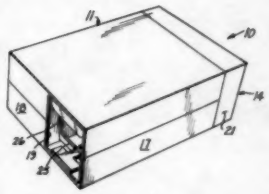


9. A floatable fishing lure casting aid and leader storage device comprising:
(a) an elongate cylindrical body member characterized by the ability to be floatable in water having first and second ends; each end comprising a substantially flat surface normal to a longitudinal axis of the body member; said body member having a cylindrical surface;
(b) first and second eyelets extending outward and generally along said axis from said first and second end surfaces near a center thereof respectively, said second eyelet adapted to attach a leader to the device;
(c) ripple reducing means provided with said first end and comprising a beveled surface extending between said body cylindrical surface and said first end surface and totally therearound, and resulting from the revolution of a generally linear curve aligned at an outer angle to a longitudinal axis of said body member so as to define a substantially truncated cone; and
(d) leader wrapping means positioned adjacent said second end to facilitate the wrapping of an associated leader about said device; said leader wrapping means comprising a planar, outwardly facing surface positioned obliquely to said second end and intersecting said second end and said body cylindrical surface; the intersection of said leader wrapping means planar surface with said second end defining a generally linear edge which is positioned between a center of said second end and said body cylindrical surface; said edge being generally perpendicular with respect to said body member axis; said planar surface being generally semi-elliptical in shape.

4,413,439
MOUSETRAP

Donald C. Lindley, 3 Skipper, Irvine, Calif. 92714

Filed Feb. 12, 1982, Ser. No. 348,270
Int. Cl.³ A01M 23/20
U.S. Cl. 43—61 28 Claims



1. A mousetrap comprising: a housing having a bottom, a top, and a peripheral sidewall forming an enclosure in which to trap a mouse; a partition inside of and extending partway across said enclosure to form an elongated, U-shaped chamber having a first and a second arm at opposite sides of a bend; an entry port through said sidewall opening into said first arm; a closure hinged to said housing for rotation around a hinge axis, said closure having its hinged edge near said entry port and having a first cocked position where it is raised to leave the entry port open to entry by a mouse, and a second closed position where it closes said entry port and frustrates the exit of a mouse from the enclosure, said closure substantially occluding said entry port in its second position; a trigger in said second arm so disposed and arranged as to be depressed by a mouse, said trigger being hinged to said housing and having a first cocked position where it is raised to await a mouse, and a second released position after a mouse has depressed it; and a latch system holding said closure and trigger in their respective first positions comprising a deflectable post supported by said housing and having a latching surface spaced from the point of attachment of said post to said housing, whereby said post inherently tends to assume a first condition wherein said latching surface is in a first position, and a second condition wherein said latching surface is in a second position, one of said latching surface positions being respective to a cocked condition of the mouse trap, a finger rotatable with said closure around its hinge axis and so disposed and arranged as to rest on said latching surface when said latching surface is in its first position, and to be free to rotate when said latching surface is in its second position, a cam rotatable with said trigger around the hinge axis of said trigger having a first position respective to a first position of said trigger and first condition of said post when there is no mouse load on said trigger, thereby permitting said post to remain in its first position with the cam lightly abutting against it and the finger resting on said latching surface and thereby holding the closure and the trigger in their first position, a mouse load on said trigger moving the trigger to its second position, turning the cam to its second position to

bend the post to its second condition, thereby moving the latching surface to its second position, releasing the finger from its first position to enable the closure to lower to its second position, to close the entry port and trap the mouse in the enclosure.

4,413,440

GOPHER PROBE AND POISON DISPENSER

Harley D. Schultz, Star Route #1, Box 293, Anza, Calif. 92306

Filed Apr. 30, 1981, Ser. No. 259,060

Int. Cl.³ A01M *25/00*

U.S. Cl. 43—124 **1 Claim**

1. A ground probe and poison dispenser comprising an upstanding tubular shank including upper and lower end portions, said lower end portion including a tapered lower terminal end and a lateral opening formed therein closely spaced above said terminal end, a hollow poison reservoir carried by a midportion of said shank intermediate said upper and lower end portions, port means communicating the interior of said shank midportion with the interior of said reservoir for gravity flow of fluent poison material from said reservoir into said shank midportion and subsequent gravity flow of said poison material downward through said shank into the lower end portion thereof and toward said lateral opening, valve member means mounted in said shank for rotation about an axis extending longitudinally of said shank between closed and open positions relative to said opening closing and opening the latter, valve member control means rotatably supported from said upper end portion of said shank and operatively connected with said valve member through a torsion rod disposed within said shank and extending through the latter to said valve member for rotating the latter between said closed and open positions, said tubular shank including handle means adapted to be engaged by a user for applying downward and upward thrust on said shank independent of said valve member and valve member control means, said hollow poison reservoir including an upstanding cylindrical pipe section considerably larger in inside diameter than the outside diameter of said tubular shank, said tubular shank extending centrally longitudinally through said pipe section, an end cap secured over the lower end of said pipe section and having a central bore formed therethrough, said tubular shank being snugly received through said central bore and longitudinally positioned relative to said pipe section and end cap with said port means disposed closely above said central bore, a 90° tubular elbow including a first internally threaded end threaded over the upper end of said pipe section and including a second externally threaded end opening horizontally outwardly of one side of said pipe section, a closure cap removably threaded over said second end, said elbow including a smooth bore formed therethrough aligned with said central bore and through which the upper end portion of said tubular shank is snugly received, said handle means including generally diametrically opposite outwardly projecting handle structures carried by said tubular shank a spaced distance above said elbow and below the upper end of said shank, a mount fixed on said tubular shank and snugly slidably received in said pipe section, fastener means secured through said pipe section and securing said mount in position within said pipe section, the upper end of said tubular shank including a generally circular and centrally apertured disc secured thereacross, said torsion rod projecting upwardly and being rotatably received through said centrally apertured disc and including a reversely curved terminus thereon terminating downwardly in an upwardly and downwardly curved portion whose terminal end includes a hand grip spaced outward of said disc, the upper end portion of said torsion rod being somewhat resilient, said disc including a generally radial groove formed in the upper surface thereof, said upwardly and outwardly curved portion comprising a detent snap receivable within said groove for frictionally retaining said torsion rod in adjusted angularly displace position.

4,413,441

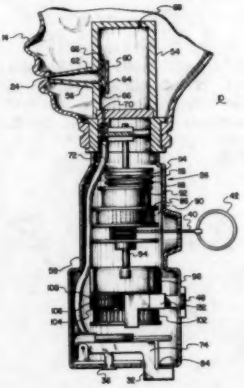
MULTIPLE FUNCTION DOLL

Gary L. Hunter, Fountain Valley; Gabriel Marason, Jr., Los Angeles, and Diana C. Troup, Cerritos, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Nov. 9, 1981, Ser. No. 319,493

Int. Cl.³ A63H *3/24, 13/02*

U.S. Cl. 46—116 **7 Claims**



1. A doll comprising a body; a controlled wetting mechanism positioned in the body including a reservoir for fluid, conduit means for conducting the fluid from the reservoir to an exit opening adjacent the bottom of the torso of the doll, valve means for starting and stopping the flow of the fluid out of the exit opening, and actuating means for automatically operating the valve whenever the doll is placed on a toy toilet; two arms, each pivotably mounted to the body and having a hand attached thereto; and a hand-clapping mechanism positioned in the body including a spring motor, an eccentric pulley driven by the motor, and means linking the pulley to the arms, whereby the arms are moved to simulate clapping by the operation of the motor.

4,413,442

THREE DIMENSIONAL TRANSFORMABLE TOY

Andrea McSweeney, 100 Morningside Dr., New York, N.Y. 10027

Filed Dec. 15, 1981, Ser. No. 330,963
Int. Cl.³ A63H 3/00
U.S. Cl. 46—151 8 Claims

1. A three-dimensional toy comprising:

(a) juxtaposed first and second surfaces, said first surface defining a complete outer surface of said toy in a first configuration, said second surface defining a complete outer surface of said toy in a second configuration, said juxtaposed first and second surfaces having means defining an opening therethrough;

(b) a plurality of figure-forming elements affixed to only said second surface such that in the second configuration said toy forms a fanciful figure, said figure forming elements being related to each other and having multiple surfaces which extend outwadly from the bulk of the toy such that the second surface of the toy is complex;

(c) said first surface being devoid of any figure forming elements such that the first surface is simple and smooth, said toy in said first configuration forming an egg from which said fanciful figure of the second configuration hatches; and

(d) said toy transformable from said first configuration to said second configuration, said transformation being performed by causing the bulk of said toy to pass through said means for defining an opening, said toy when in said first configuration being such that said first surface is on the outside of said toy and said second surface is completely hidden from view within said first surface, said second configuration being such that said first surface is located completely within said toy and said second surface is positioned outwardly from said first surface and exposed to view, said means for defining an opening being closed when said toy is in either said first or said second configuration, and being opened during said transformation, said figure-forming elements being exposable when said toy is being transformed from said first configuration to said second configuration and vice-versa such that said two surfaces and said two configurations are inter-related to one another, and said figure-forming elements changing in shape during said transformation, said transformable toy being approximately the same size in both said first and said second configurations.

4,413,443

TOY VEHICLE DEVICE

Ralph J. Kulesza, Chicago, and Howard J. Morrison, Deerfield, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

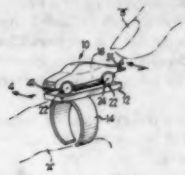
Filed Jan. 29, 1982, Ser. No. 343,879
Int. Cl.³ A63H 17/00
U.S. Cl. 46—206 11 Claims

1. A toy vehicle device comprising:

a vehicle housing including a pivotal housing portion;

means for propelling said vehicle housing;

means for supporting said housing and propelling means on the human body, said supporting means including a finger ring; and



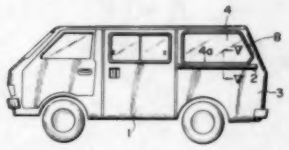
means for propelling said pivotal housing portion away from the remainder of said housing in response to impact of said housing with an obstacle.

4,413,444

GUIDE RAIL FOR A SLIDING DOOR

Takayo Chikâraishi, Kawasaki, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Jul. 16, 1981, Ser. No. 283,794
Claims priority, application Japan, Jul. 17, 1980, 55-97743; Jul. 17, 1980, 55-97744
Int. Cl.³ E05D 13/02; B60J 5/06
U.S. Cl. 49—409 8 Claims



1. A guide rail structure for a sliding door on an automotive vehicle comprising a sliding means for supporting the sliding door; and a guide rail in which the sliding means is moved, secured onto a rear quarter panel of the vehicle body;

the improvement comprising:

said guide rail located under, along and adjacent to the weather strip surrounding a rear side window; and

a lip integrally formed along the lower edge of the weather strip, arranged such that said lip seals the gap between the rear quarter panel and said guide rail.

4,413,445

SPRING-STRETCH-REDUCING WINDOW SASH BALANCE

Donald M. Trout, 19700 Woodward Ave., Detroit, Mich. 48203

Continuation-in-part of Ser. No. 180,034, Aug. 21, 1980, abandoned. This application Apr. 28, 1982, Ser. No. 372,488
Int. Cl.³ E05D 13/10
U.S. Cl. 49—445 4 Claims

1. A self-contained spring-stretch-reducing sash balance construction for double-hung, sliding sash windows to be mounted in and between laterally spaced opposite vertical sides of a sliding sash window frame, that improvement which comprises:

(a) a separately mountable, elongate slide housing for at least one side of the window having a back face portion to lie along the side of a window frame. said slide housing having a closed front center panel to be spaced outwardly from the back face to form a first, central, elongate, vertical chamber open at the back, and spaced, parallel, elongate sash guides spaced laterally to each side of said center panel, each sash guide being slotted lengthwise and spaced outwardly from the back face of the housing to provide a

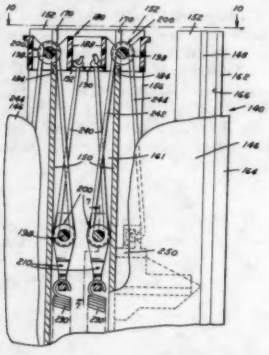
vertical reentrant retaining guide track chamber for a sash coupling element with common vertical walls between said central chamber and said guide track chambers,

(b) a sash balance header element supported horizontally at the top and within the confines of said slide housing having spaced pulley chambers formed therein at the top of and open to said vertical chamber and said guide track chambers,

(c) a stationary pulley rotatably supported in each said pulley chamber above said respective guide tracks in said slide housing,

(d) elongate balancing springs disposed in parallel spaced relation in said central vertical chamber anchored at one end adjacent the bottom of said slide housing with movable ends extending up into said central vertical chamber,

(e) a traveling pulley element affixed to the upper ends of each of said springs, and



(f) a flexible cable on each side of said slide housing having a fixed end anchored centrally of said header above said central vertical chamber and a movable end connected to sash coupling elements in the respective vertical guide track chambers,

each said cable having a first section in said central vertical chamber extending from said header to and around said traveling pulley and a second section in said vertical chamber extending from said first section beyond said traveling pulley into one of the spaced header vertical guide track chambers around a stationary pulley above said chambers, and a third section in a guide track chamber extending from said second section beyond said stationary pulley to a sash coupling in said respective guide track chambers.

4,413,446

THRESHOLD ASSEMBLY

Sebastian Dittrich, Clifton, N.J., assignor to Magnetic Weather Stripping Corp., Clifton, N.J.

Filed Aug. 19, 1981, Ser. No. 294,105
Int. Cl.³ E06B 1/70
U.S. Cl. 49—470 **17 Claims**

1. An improved threshold assembly for mounting on a door and a door sill comprising:

a. a sill mounted portion comprising, in turn:

(1) a threshold plate formed of non-magnetically attracted material, said plate having a substantially vertical end portion at one side thereof;

(2) a support depending from said threshold plate, said support and said end portion forming at least one internal channel therebetween;

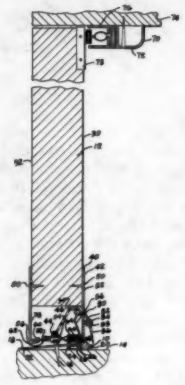
(3) at least one first elongated magnet means for insertion in said channel having an area of first polarity on the edge adjacent said end portion and an area of second polarity on the opposite edge thereof;

(4) attachment means for attaching said threshold plate to said door sill;

b. a door-mounted portion comprising, in turn:

(1) a door cap attached to the lower edge of said door and extending downwardly therefrom toward said threshold plate;

(2) magnet-holding means for supporting with the door in the closed position second elongated magnet means adjacent and above said first elongated magnet means, said magnet-holding means flexibly attached to said door cap;



(3) second elongated magnet means mounted in said magnet-holding means having an area of second polarity on the edge adjacent said end portion and an area of first polarity on the opposite edge thereof;

(4) attachment means for attaching said door cap to the lower edge of said door;

whereby, upon closing said door, at the nearly closed position the areas of like polarity of said first and said second magnet means repel and move said magnet-holding means away from said threshold plate and then at the closed position, the areas of unlike polarity of said first and said second magnet means attract to seal the door-mounted portion to the sill-mounted portion.

4,413,447

GROOVE REFINISHING TOOL

Harvey J. Kellogg, Homosassa, Fla., and Robert O. Holm, Santa Fe, N. Mex., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Mar. 11, 1981, Ser. No. 242,806
Int. Cl.³ B24B 23/00
U.S. Cl. 51—170 PT **7 Claims**

1. A device for refinishing a groove in a flat surface comprising:

a main body having a main body finishing wheel slot formed therein;

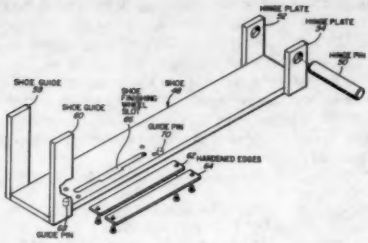
a rigid planar shoe having a shoe finishing wheel slot formed therein, said shoe pivotally mounted at one end to said main body;

a finishing wheel motor attached to said main body;

a finishing wheel attached by a collet and arbor to said finishing wheel motor such that said finishing wheel protrudes through said main body finishing wheel slot and said shoe finishing wheel slot for refinishing said groove;

slot guide means attached to said shoe and extending down-

wardly from a lower surface thereof, said slot guide means being offset from said shoe finishing slot and extending into



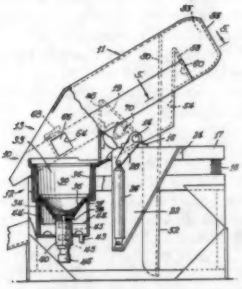
said groove for guiding said device on said groove as said device is refinishing said groove.

4,413,448

SELF-SEPARATING FINISHING MACHINE HAVING VARIABLE DEGREES OF ROTATION AND VIBRATION, AND METHOD

Gunther W. Balz, Kalamazoo, Mich., assignor to Roto-Finish Company, Inc., Kalamazoo, Mich.

Division of Ser. No. 264,399, May 18, 1981, Pat. No. 4,380,137.
This application Sep. 20, 1982, Ser. No. 419,973
Int. Cl.³ B24B *1/00*
U.S. Cl. 51—313 **2 Claims**



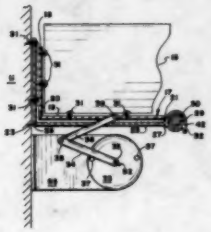
1. The method of finishing parts with finishing media in a finishing machine comprising a housing which is rotatable about a substantially horizontal axis and which has a finishing chamber in said housing and a media storage chamber in said housing and a foraminous member disposed therebetween, and first, second, and third positions of rotation, which positions are different from each other, comprising the steps of finishing said parts in said finishing chamber when said housing is in a first and finishing position, rotating said housing to a second and media-separation position, imparting vibrations of preselected intensity to said foraminous member while said housing is in said media-separation position for separation of media from parts, rotating said housing to a third and parts-ejection position, and imparting vibrations of a preselected intensity to said foraminous member while said housing is in said third and parts-ejection position for ejection of said parts from said machine.

4,413,449

MOTORIZED SYSTEM FOR CLEANING DRAIN TROUGHS

Lloyd H. Faye, 8821 Elm Rd., Richmond, Va. 23235

Filed Jan. 25, 1982, Ser. No. 342,246
Int. Cl.³ E05D *5/06*
U.S. Cl. 52—16 **5 Claims**



1. A motorized mounting bracket for a drain trough comprising:

(a) a mounting bracket comprised of:

(1) a harness member comprised of a flat rear panel and a flat bottom panel emanating from the lowermost extremity of said rear panel and terminating in a front extremity,

(2) a bracket member having a generally L-shaped configuration comprised of a flat vertical panel and a flat horizontal panel emerging from the lowermost extremity of said vertical panel and terminating in a forward extremity,

(3) said harness member being adapted to be positioned above said bracket member and closely adjacent thereto in nested configuration, and

(4) hinge means associated with the forward extremity of said bracket member and front extremity of said harness member, causing rotative interengagement of said members,

(b) an electric motor and associated spindle, said motor adapted to be positioned below said mounting bracket,

(c) drive means fixedly attached to said spindle and adapted to mechanically transmit rotative force,

(d) driven means associated with said harness member and adapted to receive motivating force from said drive means, and

(e) control means to constrain the motor to cause said harness member to rotate at least 180° about said hinge means and then return to its starting position.

4,413,450

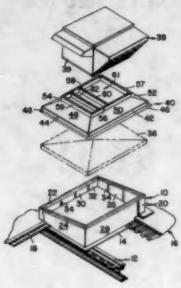
ROOF CURB ADAPTER

Gary M. Brower, 2311 East 28 St., Chattanooga, Tenn. 37407

Filed Jul. 13, 1981, Ser. No. 282,658
Int. Cl.³ E04F *19/00*; E04H *14/00*
U.S. Cl. 52—27 **8 Claims**

1. An adapter for use in combination with a roof curb for supporting a roof-top environmental control unit on the roof of a building, said roof curb being fastened to the roof and having a substantially box-shaped open top configuration including upstanding walls interconnected together to form a substantially horizontally disposed top border defining the open top, said roof-top unit including a support pedestal through which environmentally conditioned and return air flows, said adapter adopted to be interposed between said curb and said unit and comprising a base positionable upon said top border of the roof curb and having downwardly extending wall portions enveloping said border, an open frame for ingress and egress of air disposed above said base and having upstanding wall means for forming an upper peripheral edge on which said roof-top unit support pedestal is disposed, inclined surfaces fixed to and

interconnecting said base with said upstanding wall means below said peripheral edge, said inclined surfaces being interconnected together to form a continuous surface, means for



securing the pedestal of said roof-top unit to said peripheral edge, and means for securing said downwardly extending wall portions to the border of said roof curb.

4,413,451

PNEUMATICALLY ACTUATED TILTING TELESCOPING MAST CONSTRUCTION

Harry E. Featherstone, Wooster, and Alvin R. Steffen, Loudonville, both of Ohio, assignors to The Will-Burt Company, Orrville, Ohio

Filed May 5, 1982, Ser. No. 374,980
Int. Cl.³ E04F *19/00*; E04H *14/00*
U.S. Cl. 52—28 **20 Claims**

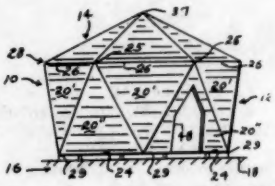
1. In a tilting, telescoping, tubular mast construction for mounting an electrical fixture on a vehicle and positioning the fixture at a desired location above the vehicle of the type in which a pneumatic control system is actuated to tilt the mast when retracted between horizontal and vertical positions and to move telescoping sections of the mast when in vertical position between retracted and extended positions; wherein the improvement comprises a seal unit for a slidable joint between any pair of adjacent telescoped mast sections, including first and second seal clamping rings, the first clamping ring being mounted on a lower open end of an inner mast section of each pair of adjacent mast sections, the second clamping ring being axially adjustably engaged to and within the first clamping ring, said first and second rings having axially spaced annular surfaces forming a circumferentially open groove at the lower axially open end of said inner mast section; a flexible seal ring in said groove U-shaped in cross section with U-legs annularly, axially open at an end of said inner mast section; and an O-ring in said groove at the open "U" of said U-legs clamped axially between the first and second clamping rings to press the O-ring into the axially open "U" of the U-legs of the U-shaped seal ring to circumferentially press the seal ring against an inner surface of the other mast section of the pair of adjacent mast sections; whereby the seal units at the lower ends of the telescoped mast sections present circular, full, unobstructed openings for such mast sections providing an unobstructed passage from end to end of the mast at all times whether telescopically retracted or extended.

4,413,452

BUILDING STRUCTURE

Don G. Wilkinson, 32 Palm Ave., Sarasota, Fla. 33577

Continuation of Ser. No. 85,525, Oct. 17, 1979. This application Jul. 8, 1981, Ser. No. 281,456
Int. Cl.³ E04B *1/32*
U.S. Cl. 52—82 **4 Claims**



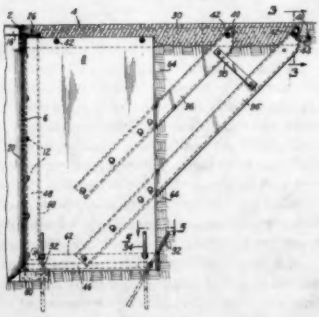
1. A building structure, comprising a plurality of identical triangular panels positioned and joined in an edge-to-edge array to define an essentially hexagonal geometric shape which functions as a roof and sidewalls, each of said triangular panels being formed from a rectangular panel having a two-to-one length to width dimensional ratio by diagonally cutting said rectangular panel to form two identical right triangular panel elements, each of said right triangular panel elements having a one-to-one base to perpendicular height dimensional ratio, and joining said right triangular panel elements along their respective perpendicular height dimensions.

4,413,453

SWIMMING POOL CONSTRUCTION

Donald H. Witte, Arlington, Tex., assignor to Carl R. Meyer and Carol S. Meyer, both of Port Isabel, Tex.

Filed Mar. 17, 1980, Ser. No. 131,222
Int. Cl.³ E04H *3/16, 3/18*
U.S. Cl. 52—127.1 **11 Claims**



1. In a swimming pool construction having an upstanding wall defined by a plurality of substantially identical modular

units, with each unit including a sheet of bendable material having an integral vertical flange at one end thereof extending perpendicular thereto and outwardly of the pool for a substantial distance, the improvement comprising an integral coping member of resilient material extending along the upper edge of the wall and including:

(a) depending flanges extending continuously along and embracing the upper edge of the wall;

(b) a substantially horizontal outwardly extending portion freely supported by the upper edge of each vertical flange and defining an upwardly facing channel; and

(c) rigid reinforcing means disposed in the channel and extending throughout the length of the upper edge of the wall for determining and maintaining the desired shape of the upper edge of the wall.

4,413,454

PREFABRICATED FRAME AND A MULTI-STOREY BUILDING INCLUDING SAID FRAME

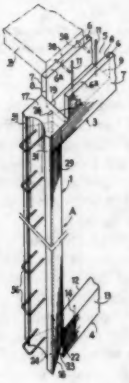
Alfred-Henri Milh, 21 Rue de Longchamp, 75016 Paris, France

Filed Jun. 4, 1981, Ser. No. 270,396

Claims priority, application France, Jun. 5, 1980, 80 12524; Mar. 4, 1981, 81 04307

Int. Cl.³ E04H *1/00*

U.S. Cl. 52—236.6 **15 Claims**



1. Prefabricated reinforced concrete frame for the construction of buildings, the frame having a contour edge defined by two uprights and two rails, each upright having an edge which comprises rigid elements anchored in the concrete and constituting projecting reinforcements which, in combination with corresponding reinforcements of at least another adjacent frame oriented at 90° or 180° to the frame, form at least a part of reinforcing ironwork of a reinforced concrete post for the assembly of two frames, the upper rail of the frame having a generally U-section defining two side walls and a bottom wall, in which U-section can be inserted with clearance the lower rail of another superjacent frame, said lower rail being formed by a solid beam, each upright having at both of the ends thereof planar and horizontal end faces, each of which end faces being set back relative to an edge of an adjacent one of said rails, which edge is part of said contour edge of the corresponding frame, the lower end face of the upright being adapted to bear, under the effect of the force of gravity, against the upper end face of the upright of another subjacent frame.

4,413,455

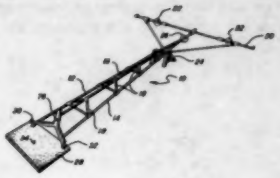
BASE SUPPORT INSTALLATION FOR TRIPOD-TYPE STRUCTURES

Walter L. Jenkins, 236 Lafayette Rd., Syracuse, N.Y. 13205

Filed Jun. 20, 1980, Ser. No. 161,250

Int. Cl.³ E02D *27/00*

U.S. Cl. 52—295 **9 Claims**



9. A support system for a tripod-type structure having an elongated, central axis for movement of such structure between erected and lowered positions wherein said central axis is substantially vertically and horizontally disposed, respectively, said support system comprising:

(a) a fixed slab having an essentially planar, horizontal, upper surface;

(b) a rigid, unitary, member connected by anchor means to said slab for pivotal movement with respect thereto about a horizontal axis, perpendicular to said tripod central axis;

(c) three mounting brackets affixed to said unitary member at equally spaced positions thereon for respective connection to the three legs of said tripod-type structure;

(d) two of said brackets being positioned on a line parallel to said horizontal axis, the third of said brackets and said horizontal axis being positioned on opposite sides of said line; and

(e) means for releasably affixing said unitary member to said slab at a single point on the same side of said line as said third bracket for securing said unitary member in a first position wherein said tripod axis is vertically disposed and releasable to permit movement of said unitary member about said horizontal axis to a second position wherein said tripod axis is horizontally disposed, all three tripod legs remaining connected to said mounting brackets during movement of said unitary member between said first and second positions thereof with the tripod legs connected to said two brackets being placed in compression and the leg connected to said third bracket being placed in tension during such movement.

4,413,456

MUD-SILL ANCHOR

Tyrell T. Gilb, Berkeley, Calif., assignor to Simpson Strong-Tie Company, Inc., San Leandro, Calif.

Filed Mar. 25, 1982, Ser. No. 362,026

Int. Cl.³ E02D *27/00*

U.S. Cl. 52—295 **7 Claims**

1. A singleside sheetmetal mudsill anchor for anchoring a sill plate to a concrete slab foundation comprising:

a. a concrete slab foundation having a generally horizontal top surface and a perimeter;

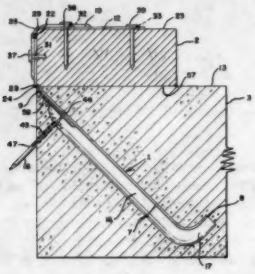
b. a nailable form board member having an inner face temporarily placed in contact with a portion of said perimeter and an upper edge positioned parallel to said top surface of said concrete slab foundation;

c. a wood mudsill having a top face and an edge positioned on said concrete slab perimeter when said concrete hardens;

d. said anchor is formed from a single piece of sheetmetal and includes an embedded leg having a distal end embedded at an angle to said top surface of said slab and positioned downwardly within said slab foundation and inwardly from said slab perimeter and having an upper end

positioned adjacent the intersection of said inner face and upper edge of said form board;

e. said anchor includes first and second laterally spaced and parallel mudsill attachment arms integrally connected to said upper end of said leg and each having a portion dimensioned for temporarily resting upon said upper edge of said form board and extending outwardly from said form board and said slab perimeter wherein the planes of said arms are temporarily on generally the same plane and



generally parallel to said top surface of said slab foundation;

f. said first and second arms are laterally spaced a distance equal to the initial width of said anchor leg and have a length selected to span said mudsill edge and a substantial portion of said mudsill top face when bent over said mudsill member from the same side of said mudsill; and

g. fastener means connecting said first and second arms to said top face of said mudsill member.

4,413,457

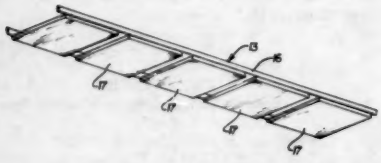
CHECKERED WALL OR CEILING SYSTEM

Albert H. Lahm, and Paul D. LaLonde, both of Lorain, Ohio, assignors to Donn Incorporated, Westlake, Ohio

Filed Feb. 5, 1981, Ser. No. 231,597

Int. Cl.³ B44F 7/00

U.S. Cl. 52—314 **15 Claims**



1. A wall, ceiling, and the like comprising a plurality of elongated members each formed from a single piece of sheet material, each member providing a pair of parallel support rails extending the length thereof and a plurality of spaced substantially rectangular pans, each pan including a rectangular planar base portion and sidewalls extending back from the plane of said base portion, one pair of opposed sidewalls connecting with said rails at a location spaced back from said base portion whereby said rails support said pans of a member in a predetermined spaced relationship in which said pans are aligned in one direction, and said members being positioned in substantially parallel spaced relationship, whereby said pans are aligned in another direction with associated pans of adjacent members, said support rails having a color substantially different from said pans which is selected to obscure the presence of said rails and to provide a system appearance of a pattern of separate rectangular pans having a depth at least equal to the length of said one pair of opposed sidewalls suspended in space.

4,413,458

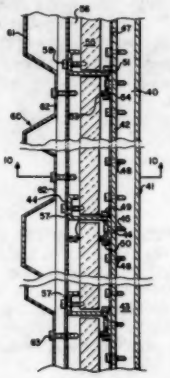
BUILDING WALL LINER ASSEMBLY

Raymond M. L. Ting, 318 Holiday Dr., Pittsburgh, Pa. 15237

Filed Aug. 5, 1981, Ser. No. 260,342

Int. Cl.³ E04C 3/00

U.S. Cl. 52—481 **14 Claims**



1. A building wall liner assembly secured to a building frame and formed from alternating structural liner panels and non-structural liner panels, comprising:

parallel, spaced apart sheet metal structural liner panels, each having a web and a first flange at one end extending normally from said web, a second flange at the other end extending normally from said web, a terminal lip on said second flange, the said second flange of each of said structural panels being connected to a building frame, said first flanges being in a common surface and said second flanges being in a common surface;

sheet metal non-structural liner panels having a metal thickness which is less than the metal thickness of said structural panels, each of said non-structural liner panels having a central surface and parallel marginal connecting elements along two opposed side edges thereof;

said non-structural liner panels being secured to said building frame between adjacent ones of said structural liner panels by means of connections between said central surface and said frame, said non-structural liner panels being further engaged along one of said side edges with a web of one said structural liner panel and being engaged along the other of said side edges to said terminal lip of the adjacent one of said structural liner panels;

whereby said second flanges and said central surfaces are in a common surface and comprise the liner wall surface of said building.

4,413,459

LAMINATED WOODEN STRUCTURAL ASSEMBLY

Alan L. Lambuth, Boise, Id., assignor to Boise Cascade Corporation, Boise, Id.

Filed Mar. 16, 1981, Ser. No. 243,774

Int. Cl.³ E04C 3/42, 3/14

U.S. Cl. 52—729 **8 Claims**

1. A laminated wooden structural assembly, comprising

(a) at least one multi-ply generally rectangular web member including a pair of spaced parallel outer layers, and at least one inner core layer bonded between said outer layers, each of said layers being formed of wood;

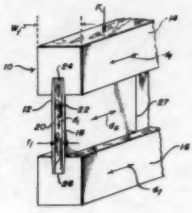
(b) at least one wooden flange member arranged adjacent

one longitudinal edge portion of said web member, the longitudinal axis of said flange member being parallel with said one longitudinal edge portion of said web member; and

(c) means rigidly connecting said web and flange members, said connecting means including

(1) a longitudinal slot contained in the surface of said flange member adjacent said web member;

(2) the longitudinal edge portion of said web member being inserted with a friction fit within said longitudinal slot; and



(3) adhesive means bonding together the mating surfaces of said longitudinal edge portion and said slot;

(d) the inner core and outer layers of said web member being arranged with their grain directions (d_i, d_o) extending toward and parallel with said flange member, respectively;

(e) said flange member being arranged with its grain direction (d_f) extending longitudinally and parallel with the grain direction of said web outer layers;

(f) the thickness dimensions of said inner core layer and said flange member being in accordance with the expression:

$$\frac{t_i}{w_f} > \frac{FS}{CS}$$

where:

t_i = total thickness of said inner core layers;

w_f = width of said flange member;

FS = fiber stress at the proportional limit, per unit area, in a compressive direction perpendicular to the grain of said flange member; and

CS = maximum crushing strength, per unit area, in a compressive direction parallel to the grain of said inner core layer.

4,413,460

METHOD OF ASSEMBLING A SPIRAL STAIR CASE

Horst Gerlach, Vorhölzerstrasse 17, 8000 München 71, Fed. Rep. of Germany

PCT No. PCT/DE80/00022, § 371 Date Nov. 1, 1980, § 102(e) Date Oct. 27, 1980, PCT Pub. No. WO80/01819, PCT Pub. Date Sep. 4, 1980

PCT Filed Feb. 29, 1980, Ser. No. 224,574

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1979, 2907959

Int. Cl.³ E04F *11/00*

U.S. Cl. 52—741 **8 Claims**

1. A method of assembling a spiral staircase to accommodate differences in the height between a lower floor and an upper floor to be interconnected by said spiral staircase having central column means including first support means for securing a lower end of said column means to a lower floor and second support means for securing an upper end of said column means to an upper floor, and treads secured to said column means, comprising the following steps:

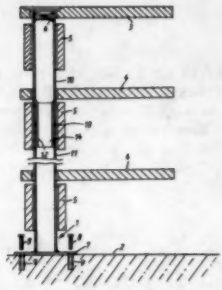
(a) providing tubular column means having a total standard length which is longer than said height between floors,

(b) providing means for telescoping said tubular column means,

(c) making at least one substantially radially extending hole through said telescoping means,

(d) cutting off a portion near a free end of said tubular column means so that the remainder of said tubular column means has an axial height corresponding to the height between a lower floor and an upper floor at a particular installation site,

(e) telescoping said tubular column means relative to said telescoping means and so that said axial height extends between the floors,



(f) making at least one further hole into said tubular column means, thereby using the first made hole as a template for making the further hole so that both holes are aligned with each other at the construction site,

(g) driving locking means through said aligned holes at the construction site, and

(h) alternately securing spacer sleeves forming rises and horizontal members forming said treads to said central column for completing said spiral staircase at the construction site.

4,413,461

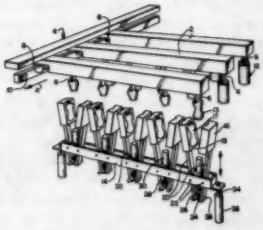
APPARATUS FOR SHAPING FROZEN CONFECTIONS

Ejvind Waldström, Hundslund, Denmark, assignor to O. G. Hoyer A/S, Hojbjerg, Denmark

Filed Jul. 20, 1981, Ser. No. 284,790

Int. Cl.³ B65B *5/04, 63/00*

U.S. Cl. 53—122 **14 Claims**



1. An apparatus for producing ice cream lollies or similar frozen material articles of irregular shape, the apparatus comprising means for producing a prefrozen material body of regular shape, at least one pair of cooperative die tools, at least one of said die tools is provided with a generally concave shaped cavity, means for mounting said die tools so as to be pivotable between an open position and a closed together position, said die tools beind disposed at a position above said means for mounting, means for pivotably moving said tools

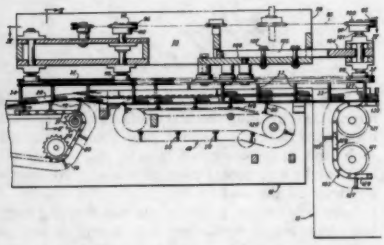
between the open position in which a receiving space is defined between the tools, and the closed together position, means for supplying said prefrozen material body to said receiving space, whereby said frozen material body is deformable into the desired irregular shape by the tools being moved to said closed together position and thereafter retracted from each other to the open position.

4,413,462

ACCUMULATOR AND STACKER FOR SANDWICHED BISCUITS AND THE LIKE

Edward Rose, Skokie, Ill., assignor to Peters Machinery Co., Subsidiary of Katy Industries, Chicago, Ill.

Filed May 12, 1981, Ser. No. 262,994
Int. Cl.³ B65B *35/50, 35/44*
U.S. Cl. 53—540 **19 Claims**



1. In a sandwiching machine and wrapping machine spaced in advance of the sandwiching machine a stacker cooperating with the sandwiching machine to stack sandwiches delivered therefrom and cooperating with the wrapping machine to effect the accumulation of stacked sandwiches into two, three, or four stacks in tandem arrangement relative to each other to thereafter be wrapped by the wrapping machine,

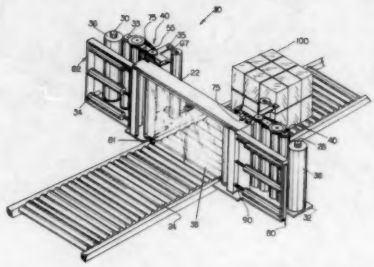
two side by side sandwiching carrying conveyor troughs extending from the sandwiching machine over the wrapper and carrying sandwiches for stacking and having flight receiving slots extending therealong, a first trough for one row of sandwiches declining to substantially the plane of the top of the wrapping machine and having a first conveyor extending therealong and a second trough for the other row of sandwiches having a second conveyor and extending parallel to the first trough for the one row of sandwiches and angularly toward the trough for the one row of sandwiches and therealong to intersect the line of travel of the one row of sandwiches, the sandwiches in each trough being carried by the flights of said second conveyor and carried therealong as the flights recede beneath the bottom of its trough and the flights depending from the intersecting trough carry the sandwiches in both troughs in aligned relation for stacking said second trough extending along a wrapper conveyor for a portion of the length thereof and constructed to enable the depending flights to pass outwardly out said second trough beyond a sidewall thereof to a return path of said flights, and disengage the sandwiches in a decelerating path as the flights move outwardly of the sidewall of said second trough, to avoid crumbling of the trailing edges of the sandwiches as said flights move out of engagement therewith.

4,413,463

ROLLER STRETCH PASS THROUGH STRETCHING APPARATUS AND PROCESS

William G. Lancaster, Louisville, Ky., assignor to Lantech, Inc., Louisville, Ky.

Filed Oct. 23, 1980, Ser. No. 200,013
Int. Cl.³ B65B *11/08, 13/04*
U.S. Cl. 53—399 **22 Claims**



18. A process for wrapping a web of stretched film material around a load carried by a conveyor with a pass through film wrapping apparatus comprising the steps of:

a. placing a composite film web comprising two film webs having their leading ends sealed together across the path of a transported load;

b. transporting said load ino said composite film web to engage said composite film web and carry said composite film web;

c. simultaneously pre-stretching each of the two film webs independently before the webs engage the load substantially beyond the film web's yield point by passing each said film web through pre-stretch means each comprising an upstream roller and a downstream roller driven at different relatively constant speeds to exert a force on the film webs so that the upstream roller retards each said film web with respect to said downstream roller;

d. relieving a portion of the force experienced by each of the film webs during pre-stretching after leaving said downstream rollers and while wrapping the film web around the load;

e. stopping the movement of the load along the conveyor path after it has passed the wrapping apparatus with the rear of the load positioned downstream of a pair of opposed sealing jaws;

f. moving said opposed sealing jaws inward toward each other against the film webs to superimpose the webs;

g. sealing the webs together in at least two places to form a composite web; and

h. cutting the webs between the spaced apart seals allowing a severed composite film web to hold the load under composite force.

4,413,464

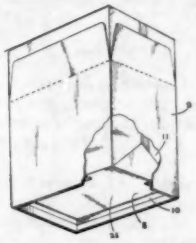
PROCESS OF PRODUCING A PACKAGE OR WRAPPING FOR STORING OR SHIPPING MATERIAL

Lars-Göran Larsson, Malmö, and Bertil S. O. Murne, Oxie, both of Sweden, assignors to Aktiebolaget Platmanufaktur, Malmö, Sweden

Division of Ser. No. 681,231, Apr. 28, 1976, abandoned. This application Sep. 21, 1977, Ser. No. 835,050
Int. Cl.³ B65B *43/08, 61/18*
U.S. Cl. 53—412 **8 Claims**

1. A method of forming a package filled with material comprising folding a continuous flat sheet of flexible material onto a mandrel to form an inner container having four side walls, an open top, and a closed bottom wall which define a parallelepi-

ped shape, the material having overlapping edges extending along each of two of said four side walls opposite to one another, joining the overlapping edges along the entire longitudinal length of each of the side walls to form a longitudinal seam therealong with a flap extending from said bottom wall, each of the longitudinal seams extending continuously from the side wall along the respective flap, forming a transverse seam at each said flap at the juncture thereof with the respective side wall, folding said flaps around the transverse seams and into sealed engagement against the respective side walls, said bottom wall being constituted by the thickness of the sheet of material of the inner container and being free from flaps and folds to form a flat smooth surface, forming an outer container of stiffer material than the inner container with four side walls corresponding to said four side walls of said inner container and opposite open ends, and a circumferential flange positioned adjacent to and spaced from one end of the outer container, said circumferential flange extending inwardly from the inner surfaces of said four side walls of said outer container,



inserting the inner container into the outer container through the other of the open ends so that the bottom wall of the inner container rests on said circumferential flange, securing the bottom wall of the inner container to the circumferential flange, the transverse seams at said flaps of the inner container stabilizing the folds between the flaps and the side walls of the inner container and also stabilizing the shape of the inner container in the region where the bottom wall is secured to the circumferential flange of the outer container, filling the inner container with the material to be stored therein, closing and sealing the open top of the inner container and the outer container at said other of the open ends, inverting the containers so that the bottom wall of the inner container faces upwardly and constitutes the end at which the material can be removed from the inner container by opening said bottom wall, and sealably and removably fitting a cover lid within the outer container to rest on the circumferential flange such that by removing said cover lid and cutting open said bottom wal of said inner container at the opening defined by said circumferential flange the filling material in said inner container may be discharged.

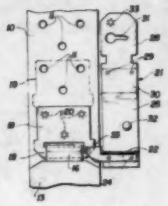
4,413,465

STIRRUP ADJUSTING AND LOCKING DEVICE

Earl L. Blevins, and Joan V. Blevins, R.R. 2, both of Wheatland, Wyo. 82201

Filed Dec. 14, 1981, Ser. No. 330,486
Int. Cl.³ B68C *1/16*; A44B *11/20*
U.S. Cl. 54—46 **7 Claims**

1. In a saddle stirrup, a stirrup suspension strap including two length adjustable strap sections, one strap section having a plurality of adjusting and locking openings formed therethrough, a flat adjusting and locking plate fastened to the other strap section and having spaced locking pins projecting from one side thereof for entry into selected openings of said one strap section, a U-formed locking buckle having an open end and a closed end pivotally attached to said locking plate and adapted to be swung across the latter and across said one strap section into straddling relationship therewith, a flexible strap having a free end carried by the U-formed locking buckle and adapted to be extended around the open end of said buckle and around an adjacent edge of the said one strap section, a rigid



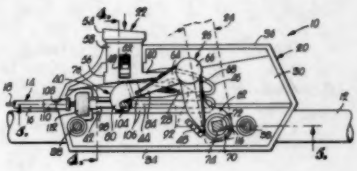
hasp plate secured to the free end of said flexible strap and having a locking slot therein, and an eccentrically located locking stud on one side wall of the buckle engageable lockingly within the locking slot of the hasp plate.

4,413,466

CONTROL ASSEMBLY FOR BLADE CLUTCH UNIT

Anthony F. Beugelsdyk, Wichita; Terence J. Stuchlik, Emporia, and Bruce J. Kester, Wichita, all of Kans., assignors to Conchemco, Incorporated, Lenexa, Kans.

Filed Jan. 11, 1982, Ser. No. 338,480
Int. Cl.³ A01D *75/20*
U.S. Cl. 56—11.3 **12 Claims**



1. A power lawnmower control apparatus for connection to a disengageable clutch coupling the lawnmower motor and blade, said apparatus comprising:

movable operating means;

shiftable handle means;

cable means for operative connection to said clutch including an end portion biased to a first position corresponding to the disengaged position of said clutch and shiftable to a second position corresponding to the engaged position of said clutch; and

operating mechanism, including—

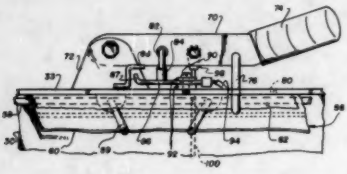
coupling means operatively connected to said handle means and shiftable to a position adjacent said cable end portion wherein said coupling means is engageable by said operating means upon movement thereof for coupling said coupling means with said cable end portion for thereafter causing movement of the cable end portion from said first to said second position thereof upon shifting of the handle means; and

means engageable with said coupling means for disengaging said coupling means from said cable end portion when said handle means is released and said cable end portion moves from said second toward said first position thereof.

4,413,467
DISPOSABLE BAG MOUNTING AND SHUTDOWN MECHANISM FOR ROTARY LAWN MOWER

Ramiro Arizpe, 9938 Donegal, Dallas, Tex. 75218

Division of Ser. No. 236,537, Feb. 20, 1981, Pat. No. 4,345,418.
This application Jun. 28, 1982, Ser. No. 393,126
Int. Cl.³ A01D *75/20, 69/10*
U.S. Cl. 56—11.3 8 Claims



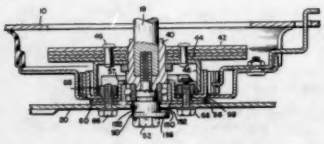
1. In a rotary power lawnmower;

a housing, motor means mounted on said housing and including a power takeoff shaft drivably connected to rotary mower blade means, brake means operably connected to said blade means to arrest rotation of said blade means, said housing including a discharge chute for conveying grass cuttings entrained in a moving air stream generated by said blade means away from said housing, means on said housing for supporting grass collection bag means in flow receiving communication with said discharge chute for receiving said grass cuttings, and a movable locking member associated with said support means and adapted to be moved between locking and release positions for releasably retaining said bag means on said support means, and actuating means interconnecting said brake means and said locking member and responsive to the movement of said locking member to said release position to cause said brake means to brake the rotation of said blade means.

4,413,468
LAWN MOWER BLADE RETAINER

Harold M. Hockersmith, Richmond, Ind., assignor to Hoffco, Inc., Richmond, Ind.

Filed Apr. 2, 1982, Ser. No. 364,992
Int. Cl.³ A01D *55/18*
U.S. Cl. 56—295 10 Claims



1. A safety mounting for a rotary lawn mower blade, comprising

a blade carrier mounted for rotation on the axis of a depending drive shaft, and plurality of eccentrically positioned blade bolts for securing a blade to the carrier,

a blade having bolt holes for the reception of said blade bolts and having a central opening which lies on the axis of the carrier when the blade is mounted on the carrier,

a blade retainer fixed on the drive shaft, having a cylindrical shank extending through said blade opening and a head below the blade,

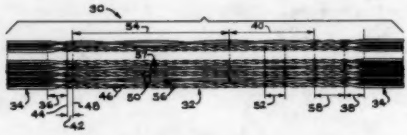
said blade having bearing portions at the edge of said opening in bearing clearance relation with said retainer shank so as to hold the blade substantially concentric with the shank in the absence of blade bolts,

said blade opening and retainer head having complementary unsymmetrical shapes adapted to register with each other in not more than a small limited number of relative orientations to permit axial movement of the blade off the retainer and to block such axial movement in all other orientations.

4,413,469
METHOD OF MAKING LOW CROSSTALK RIBBON CABLE

Patrick J. Paquin, Hamden, Conn., assignor to Allied Corporation, Morristown, N.J.

Filed Mar. 23, 1981, Ser. No. 246,800
Int. Cl.³ H01B *13/04, 13/06*
U.S. Cl. 57—293 19 Claims



1. A method of making multi-conductor cable having a plurality of longitudinally extending insulated conductor pairs with each of said insulated conductor pairs having twisted pair portions alternating in series with straight portions, comprising:

twisting a first plurality of first pairs of individually insulated moving conductors in a first direction;

twisting a second plurality of second pairs of individually insulated moving conductors in a second direction opposite to said first direction;

passing said first plurality of pairs of individually insulated moving conductors through a plurality of first twister tubes intermittently rotatably operated in said first direction;

passing said second plurality of pairs of individually insulated moving conductors through a plurality of second twister tubes intermittently rotatably operated in said second direction;

in a first cycle, operating said first twister tubes and said second twister tubes to twist said first plurality of pairs of individually insulated moving conductors and said second plurality of pairs of individually insulated moving conductors into parallel twisted pair portions alternately laterally disposed and hav ng respective first and second lengths of twist and respective first and second directions of twist, terminating the operation of said first and second twister tubes but not the forward movement of said conductors forming said twisted pair portions, and shortly after terminating the operation of said first and second twister tubes positively maintaining each of said moving, insulated conductors forming said twisted pair portions along straight, precisely laterally spaced, paths for a predetermined distance to thereby form said straight portions of said multi-conductor cable;

successively repeating said first cycle to form insulated conductor pairs having twisted pair portions alternating in series with said straight portions;

simultaneously with said first and successive cycles, bonding said twisted pair portions of said insulated moving conductors and said straight portions of said insulated moving conductors to at least one longitudinally extending plastic sheet while positively maintaining a first precise lateral spacing of said twisted portions during bonding, and positively maintaining a second precise lateral spacing of said straight portions alternating with said twisted portions during bonding; and

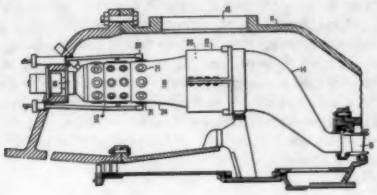
cooling the cable so formed.

4,413,470

CATALYTIC COMBUSTION SYSTEM FOR A STATIONARY COMBUSTION TURBINE HAVING A TRANSITION DUCT MOUNTED CATALYTIC ELEMENT

Paul E. Scheihing, Glen Mills, and James A. Laurelli, Springfield, both of Pa., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Mar. 5, 1981, Ser. No. 240,716
Int. Cl.³ F02C *7/20*
U.S. Cl. 60—39.32 **11 Claims**



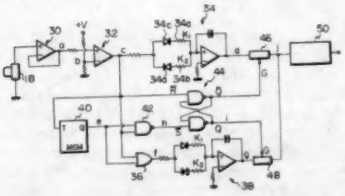
1. A catalytic combustion system for a stationary combustion turbine having a casing comprising a supported combustor basket having means for burning primary fuel to provide a preheated gas, means for mixing secondary fuel and air with the preheated gas, a transition duct disposed downstream from said combustor basket, means for supporting said duct relative to the turbine casing, a catalytic unit, means for supporting said catalytic unit relative to an upstream portion of said transition duct to put the thrust load from said catalytic element on said duct supporting means, and means for coupling an outlet portion of said combustor basket to an inlet of said catalytic unit.

4,413,471

AIR-FUEL RATIO CONTROL APPARATUS OF AN INTERNAL COMBUSTION ENGINE

Kyo Hattori; Noriyoshi Shibata, both of Susono, and Isamu Hagino, Aichi, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 2, 1981, Ser. No. 326,653
Claims priority, application Japan, Dec. 3, 1980, 55-169654
Int. Cl.³ F01N *3/08*
U.S. Cl. 60—276 **4 Claims**



1. An air-fuel ratio control apparatus of an internal combustion engine comprising:

means for detecting the concentration of a predetermined component in the exhaust gas to generate an electrical signal which indicates the detected concentration;

means for comparing the level of said generated electrical signal with a predetermined reference level to produce a discrimination signal having a first or second level which is different from each other;

first integration means for integrating, with respect to time, said discrimination signal to produce a first integration signal which is increased during the first level period of said discrimination signal and decreased during the second level period of said discrimination signal, the integration time constant for increasing the integration signal being larger than the integration time constant for decreasing the integration signal;

second integration means for integrating, with respect to time, said discrimination signal to produce a second integration signal which is increased during the first level period of said discrimination signal and decreased during the second level period at least after a predetermined period just after the first level period of said discrimination signal, the integration time constant for increasing the integration signal being larger than the integration time constant for decreasing the integration signal;

means for selecting said first integration signal or said second integration signal in response to said discrimination signal; and

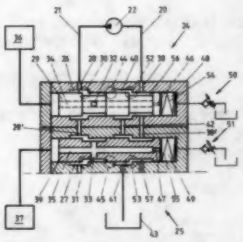
means for adjusting the air-fuel ratio condition of the engine is response to said selected integration signal of said selection means.

4,413,472

HIGH-PRESSURE PUMP WITH PRESSURE REGULATOR

Armin Lang, Schwabisch, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

Filed Jul. 24, 1980, Ser. No. 172,032
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1979, 2930107
Int. Cl.³ F15B *13/02*
U.S. Cl. 60—420 **6 Claims**



1. In combination with a fluid operated device, a fluid reservoir, a pump having suction and pressure lines, a fluid supply line connected to the fluid operated device, and a pressure regulator connected to the reservoir and located between said suction and pressure lines, including a control piston (**7, 29, 39**) having opposed end faces (**10** and **12**) and spring means (**11-15, 48-54, 49-55**) loading one of the end faces (**10**) for restricting flow through the suction line as a function of operating pressure of fluid in the supply line to which the other of the end faces (**12**) is exposed and blocking flow through the suction line at a predetermined level of the operating pressure in response to which the pressure line is connected to the reservoir, the improvement comprising restricted passage means (**14, 46, 47**) in the piston for conducting restricted flow of the fluid between the opposed end faces thereof, to automatically vary flow in the suction line, and pressure responsive pilot means (**17, 50, 51, 64**) operatively associated with said spring means for controlling the operating pressure through the pressure regulator.

4,413,473

HEAT TRANSFER COMPONENTS FOR STIRLING-CYCLE, RECIPROCATING THERMAL MACHINES

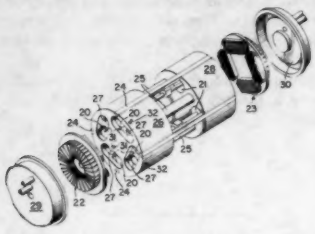
William M. Moscrip, 309 Ellery Ct., Fredericksburg, Va. 22401

PCT No. PCT/US82/00651, § 371 Date Jul. 28, 1982, § 102(e) Date Jul. 28, 1982, PCT Pub. No. WO82/04101, PCT Pub. Date Nov. 25, 1982

PCT Filed May 14, 1982, Ser. No. 403,773

Int. Cl.³ F02G *1/04*

U.S. Cl. 60—517 **4 Claims**



1. A Stirling-cycle, reciprocating, thermal machine having an expansion space, a compression space, a regenerator, a working fluid enclosed in said spaces and in ducts permitting oscillatory flow of said fluid between said spaces through said regenerator, a heater for transmitting heat from an external heat source to working fluid in the expansion space, a cooler for transmitting heat from working fluid in the compression space to an external heat sink, the heat transfer element of at least said heater being constructed of a material having high thermal conductivity and being affixed to said machine by joining structure having low thermal conductivity, said transfer element and said joining structure having substantially the same linear thermal expansion coefficients.

4,413,474

MECHANICAL ARRANGEMENTS FOR STIRLING-CYCLE, RECIPROCATING THERMAL MACHINES

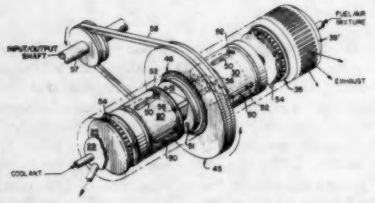
William M. Moscrip, 309 Ellery Ct., Fredericksburg, Va. 22401

PCT No. PCT/US82/00649, § 371 Date Jul. 29, 1982, § 102(e) Date Jul. 29, 1982, PCT Pub. No. WO82/04099, PCT Pub. Date Nov. 25, 1982

PCT Filed May 14, 1982, Ser. No. 406,729

Int. Cl.³ F02G *1/04*

U.S. Cl. 60—517 **7 Claims**



1. A reciprocating, single-acting, multiple-piston, Stirling-cycle thermal machine which includes a frame; at least one pair of stationary, coaxial, in-line, right-circular cyclinders mounted in said frame, said cylinders being thermally isolated from each other, open at their adjacent ends and closed at their remote ends, one of said cylinders enclosing an expansion space of the machine and the other enclosing a compression space of the machine; an external heat source; an external heat sink; regenerators for each cylinder pair; a heater for each expansion space comprising a heat exchanger element closing the remote end of the expansion space and serving to thermally conductively connect said source to the machine working fluid; a cooler for each compression space comprising a heat exchanger element closing the remote end of the compression space and serving to thermally conductively connect said sink to the machine working fluid; a piston arranged to reciprocate within each of said cylinders, locked against rotation relative thereto and sealing the open end thereof, the pistons of each coaxial pair of cylinders being mechanically linked; cam and cam follower means operatively connecting said pistons to a rotary drive mechanism turning about an axis coaxial with the principal machine axis of symmetry, the symmetry plane of said drive mechanism normal to its axis of rotation being coincident with the plane of symmetry of the reciprocating parts of the machine; the machine working fluid being contained in one or more isolated stages comprising an expansion space, a heater, a regenerator, a cooler, and a compression space connected in series by passages permitting oscillating flow between said spaces.

4,413,475

THERMODYNAMIC WORKING FLUIDS FOR STIRLING-CYCLE, RECIPROCATING THERMAL MACHINES

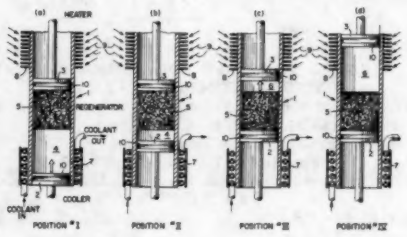
William M. Moscrip, 309 Ellery Ct., Fredericksburg, Va. 22401

PCT No. PCT/US82/00648, § 371 Date Jul. 28, 1982, § 102(e) Date Jul. 28, 1982, PCT Pub. No. WO82/04098, PCT Pub. Date Nov. 25, 1982

PCT Filed May 14, 1982, Ser. No. 403,770

Int. Cl.³ F02G *1/04*

U.S. Cl. 60—521 **4 Claims**



1. A Stirling-cycle, reciprocating, thermal machine in which the internal working fluid is a gas that has a molecular weight substantially greater than that of air, is non-toxic, nonflammable, chemically and thermally stable, with a heat transfer coefficient substantially greater than that of hydrogen at machine operating temperatures and pressures and can be easily liquefied under pressure at room temperature, and comprising a control system including means for varying the main system mean operating pressure by rapid injection of working fluid from a reservoir into the working volume as a liquid to increase that pressure and by withdrawal of working fluid as a gas from that working volume and its condensation in the reservoir to reduce that pressure.

4,413,476

GEOGRAPHICALLY POSITIONED, ENVIRONMENTAL, SOLAR HUMIDIFICATION ENERGY CONVERSION

Gene S. Kira, 7986 Amargosa Dr., Carlsbad, Calif. 92008, and Jens O. Sorensen, P.O. Box 2274, Rancho Sante Fe, Calif. 92067

Filed Dec. 23, 1980, Ser. No. 220,175

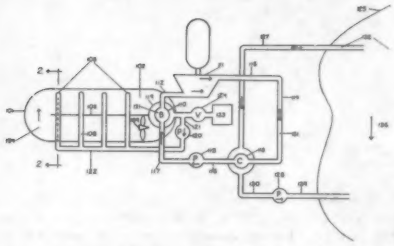
Int. Cl.³ F03G *7/02*

U.S. Cl. 60—641.8 **16 Claims**

1. A method of geographically positioned, environmental

solar humidification energy conversion comprising the steps of:

(a) providing air in a solar collector;
(b) providing water in the solar collector;
(c) combining the provided air with the provided water in the solar collector to create humid air;
(d) heating the provided air, the provided water and/or the humid air by the solar collector to create warm humid air;
(e) transporting the warm humid air to a boiler of a closed cycle power system;
(f) providing a working fluid in the boiler of the power system;
(g) heating the working fluid in the boiler with the transported warm humid air whereby the working fluid is pressurized and the warm humid air is cooled, whereby some water vapor condenses;
(h) converting the energy of the pressurized working fluid by passing the fluid through a turbine to produce a useful form of energy, thereby expanding the working fluid;
(i) transporting the expanded working fluid to a condenser of the closed cycle power system;



(j) introducing waste water from an environment body of water;
(k) transporting the waste water to the condenser of the power system;
(l) cooling the transported expanded working fluid in the condenser with the transported waste water, whereby the working fluid condenses, thereby heating the waste water;
(m) recycling the cooled working fluid to provide said working fluid in the boiler of the power system;

wherein step (b) comprises the step of:

(1) distributing the provided water through a network of conduits to an array of emitters and

wherein step (c) comprises the steps of:

(1) emitting the distributed water by the emitters whereby the emitted water travels down some absorbent filaments, where each filament is suspended in the air from the emitter to which it is connected
(2) absorbing the emitted water by the filaments
(3) evaporating the absorbed water from the filaments.

4,413,477

LINER ASSEMBLY FOR GAS TURBINE COMBUSTOR

Gilbert J. Dean, Ballston Spa, and Loren H. White, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 29, 1980, Ser. No. 220,272
Int. Cl.³ F02G *3/00*
U.S. Cl. 60—757 **15 Claims**

1. A liner assembly for a combustor used in connection with a gas turbine, said liner assembly comprising:

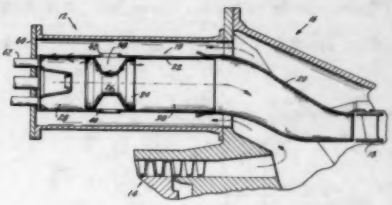
an outer structural shell;

a separate throat insert flexibly coupled to and situated in said outer shell;

said throat insert including a reduced throat section effective to divide said outer shell into an upstream chamber and a downstream chamber;

a plurality of upstream fingers defined by a plurality of slots in an upstream end of said throat insert;

means for connecting each of said upstream fingers to said outer shell; and



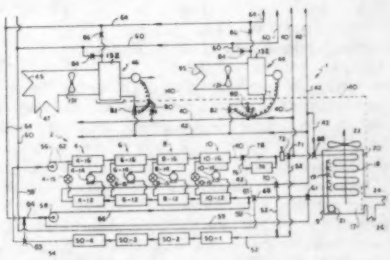
a plurality of downstream fingers on a downstream end of said throat insert, said downstream fingers including means for coupling said downstream end to said outer shell.

4,413,478

AIR CONDITIONING SYSTEM AND METHOD

Alden I. McFarlan, 691 Dorian Rd., Westfield, N.J. 07090

Continuation-in-part of Ser. No. 301,655, Sep. 14, 1981. This application Jan. 18, 1982, Ser. No. 340,328
Int. Cl.³ F25D *17/02*
U.S. Cl. 62—98 **15 Claims**



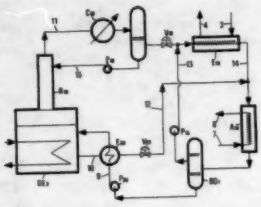
4. A method of air conditioning a plurality of spaces which comprises the steps of, producing three separate continuous streams respectfully of hot water and cold water and neutral water wherein the temperature of said neutral water is between the temperatures of said streams of hot water and cold water, delivering a heat-transfer stream of water to each of a plurality of air-treating units which are remote from each other and each of which cools or heats a stream of air which is delivered to an air-conditioned space, and wherein each of said heat-transfer streams is formed from a stream of said hot water or a stream of said cold water or a stream of said neutral water of a mixture of said neutral water with water from only one of said streams of hot water or cold water, controlling the formation of each of said heat-transfer streams in accordance with the air heating or air cooling required of the said heat-treating unit to which that said heat-transfer stream flows, and supplying neutral water to any of said air-treating units which is required to heat air when the dominant action of the other of said air-treating units is to cool air, and returning separate streams from said units receiving hot water and cold water.

4,413,479

PROCESS FOR PRODUCING COLD AND/OR HEAT BY MEANS OF AN ABSORPTION CYCLE

Alexandre Rojey, Garches, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Apr. 15, 1982, Ser. No. 368,591
Claims priority, application France, Apr. 15, 1981, 81 07751
Int. Cl.[3] F25B 15/00
U.S. Cl. 62—101 13 Claims



1. Process for producing cold and/or heat according to an absorption cycle operated with a working fluid (F), a solvent (S) for said working fluid and an auxiliary fluid (H), characterized by the steps of:

(a) contacting, in an absorption/condensation step, a liquid phase of solvent (S) with a gas phase comprising both the working fluid (F) and a fluid (H), so as to obtain a solution of the fluid (F) in the solvent (S) and a liquid phase of fluid (H), the liquid phase of fluid (H) being at least partly immiscible with the solution of the fluid (F) in the solvent (S) and the fluid (H) being a fluid which can vaporize in the conditions of step (e) and condense in the conditions of step (a), the absorption heat of the fluid (F) in the solvent (S) and the condensation heat of the fluid (H) being transferred to an external fluid,

(b) separating the solution of fluid (F) in the solvent (S) from the liquid phase of fluid (H),

(c) supplying the solution of fluid (F) in solvent (S), recovered from the step (b), to a desorption step and subjecting said solution to desorption conditions, the desorption heat being supplied by an external fluid, so as to form a liquid phase of decreased content of fluid (F) and a vapor phase of high content of fluid (F), and recycling said liquid phase of decreased content of fluid (F) to the absorption/condensation step (a) to form the liquid phase of solvent (S),

(d) condensing at least a portion of the vapor phase of high content of fluid (F), recovered from the desorption step (c), and delivering heat to an external fluid, to obtain a liquid condensation phase,

(e) admixing at least a portion of the liquid condensation phase, obtained in step (d), with at least a portion of the liquid phase of fluid (H) recovered from step (b), vaporizing at least a portion of the resultant mixture with heat supplied from an external fluid, the operating conditions being so selected as to allow vaporization of at least a portion of the fluid (F) and at least a portion of the fluid (H), and

(f) recycling the resultant gas phase to the step (a),

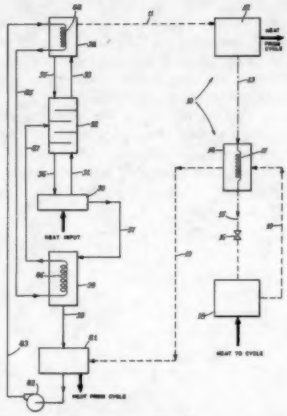
the fluid (H) being so selected that the maximum variation of its vapor pressure be comprised between 40 and 80% of the minimum vapor pressure of the fluid (F), and the ratio of the molar feed rate of fluid (H) to the molar feed rate of fluid (F) representing at least 80% of the ratio of the vapor pressure of the fluid (H) at the end of the vaporization step (a) to the vapor pressure of the fluid (F) at the beginning of the vaporization step, both molar feed rates being determined at the beginning of the vaporization step.

4,413,480

HYPERABSORPTION SPACE CONDITIONING PROCESS AND APPARATUS

Robert A. Macriss, Deerfield, and Thomas S. Zawacki, Oak Park, both of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed Apr. 5, 1982, Ser. No. 365,792
Int. Cl.[3] F25B 15/00, 17/08
U.S. Cl. 62—112 21 Claims



1. In a closed cycle space conditioning process of the type comprising the steps of sequentially absorbing a refrigerant vapor in a liquid in an absorber zone with removal of heat energy from the cycle, passing said absorbed refrigerant vapor in said liquid to a generator zone and heating said absorbed refrigerant vapor in said liquid causing vaporization freeing said refrigerant vapor from liquid, passing said refrigerant vapor to a condenser zone condensing said refrigerant vapor to a refrigerant liquid with removal of heat energy from the cycle, passing said condensed refrigerant liquid through a pressure reduction zone vaporizing said condensed liquid, passing said refrigerant vapor to an evaporator zone and heating said refrigerant vapor by addition of heat energy to the cycle, and passing said heated refrigerant vapor to said absorber zone for repeat of the cycle, the improvement comprising:

sequentially in a closed cycle maintaining in said absorber a substantially saturated salt working solution of a salt having an exothermic heat of crystallization, passing said substantially saturated working solution to said generator, crystallizing said salt from said working solution to form a solid phase salt in said generator, and passing a slurry of said solid phase salt in a solution of said salt to said absorber wherein said solid phase salt is dissolved to form said substantially saturated salt working solution whereby the exothermic heat of said crystallization is utilized to aid said vaporization in said generator zone.

4,413,481

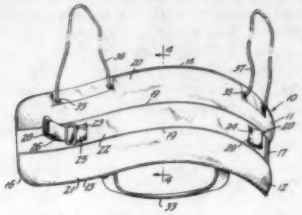
PORTABLE BEVERAGE COOLER

William S. Thomas, 160-19 Normal Rd., Jamaica, N.Y. 11432

Filed Jul. 19, 1982, Ser. No. 399,300
Int. Cl.[3] F25D 3/08
U.S. Cl. 62—371 3 Claims

1. An improved portable beverage cooler comprising: a flexible planar main body element including inner and outer walls of generally rectangular configuration, said walls being interconnected at the peripheral upper, lower, and end edges thereof, and along a pair of parallel longitudinally extending areas to define upper and lower pockets for the sealed reten-

tion of a cooling medium, and a medially disposed pocket, said medially disposed pocket having transversely extending slotted openings in said outer wall leading thereto disposed medially of said end edges of said main body element; an elongated elastic member slidably disposed within said medially disposed pocket, and having first and second ends provided with mutu-



ally interconnecting means; and an elongated strap member having first and second ends interconnected to said main body element adjacent said lower edge thereof; whereby when said main body element is wrapped about a beverage container of predetermined diameter, said last mentioned strap is positioned beneath a lower wall of said container to prevent relative slipping between said main body element and said container.

4,413,482

CAM-SUPPORT FOR A KNITTING MACHINE

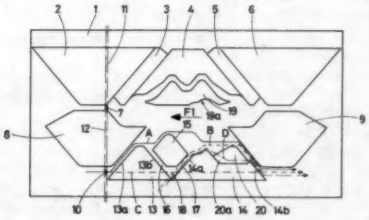
Gerard Steiger, Montreux, Switzerland, assignor to Atelier de Construction Steiger S.A., Switzerland

Filed Jun. 5, 1981, Ser. No. 270,966

Claims priority, application Switzerland, Jun. 16, 1980, 4608/80

Int. Cl.³ D04B *7/00*

U.S. Cl. 66—78 **1 Claim**



1. A cam support for a knitting maching for the entrainment of push-rods, respectively of the needles, according to the so-called "three way" technique, comprising several lifting cams intended to entrain the abutment surfaces of the push-rods, respectively of the needles, at several different selection points, so that the needles operate either in a knit, tuck or miss position, characterised by the fact that it comprises at least one arrangement of lifting cams comprising two lifting cams arranged immediately one after the other and each comprising two opposed ramps and a third lifting cam disposed between the adjacent ramps of the of the two first cams, an empty space being provided below this third cam, said space being connected to two channels limited on one side by the adjacent ramps of the first two cams, so that a push-rod, respectively of a needle, selected before the arrival of an outer end of said first cams, is entrained by one of the said first cams, in the direction of movement of the cam-support and by the third cam and operates in the knit position, whereas a push-rod, respectively of a needle, selected when said empty space arrives approximately opposite said push-rod, respectively of a needle, is not entrained by the third cam and operates in the tuck position.

4,413,483

CONTROL MECHANISM FOR CIRCULAR KNITTING MACHINE

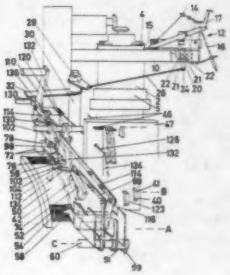
William C. Smith, and Gerald A. G. Seekings, both of Leicester, England, assignors to Bentley Engineering Company Limited, Leicester, England

Filed Sep. 30, 1980, Ser. No. 192,637

Claims priority, application United Kingdom, Oct. 1, 1979, 7933905

Int. Cl.³ D04B *15/38, 15/66*

U.S. Cl. 66—125 R **7 Claims**



1. Circular knitting machine having a needle cylinder, a cam system surrounding the cylinder, needles in the cylinder operable by the cam system, yarn feeders for supplying yarn to the needles for knitting, a cam drum, cams on the cam drum, a cam drum racking mechanism, a control means for selectively activating the cam drum racking mechanism with predetermined interruptions,

wherein said control means includes a timing drum, control elements mounted on said timing drum for controlling activation of the cam drum racking mechanism, a rack-wheel rotatable with the timing drum, a racking lever, a pivot mounting the racking lever at a position intermediate its ends a small increment racking means pivotably mounted on the lever for engaging the rackwheel on one side of the pivot mounting at a small radius to thereby rack the timing drum at increments smaller than the increments with which the cam drum racking mechanism racks the cam drum, a larger increment racker pivotably mounted on the lever for engaging the rackwheel on the other side of the pivot mounting at a larger radius than the small increment racking means to thereby rack the timing drum at increments larger than the increments with which the cam drum racking mechanism racks the cam drum, a manually operable control member to activate the large increment racker, to cause the yarn feeders to cease supplying yarn to the needles for knitting and to override the control means so that the cam drum racking mechanism operates without interruption to enable the cam drum and timing drum to be zeroed.

4,413,484

BASKET GOAL NET

Hiroyuki Ogura, Kyoto, and Toyoyuki Kuroda, Kuwana, both of Japan, assignors to Raschel Co., Ltd., Japan

Filed Jul. 16, 1981, Ser. No. 284,093

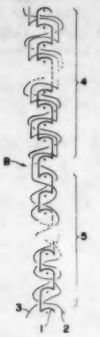
Claims priority, application Japan, Jul. 28, 1980, 55-107431[U]; Jul. 28, 1980, 55-107432[U]; Nov. 19, 1980, 55-163493; Mar. 19, 1981, 56-039885

Int. Cl.³ D04B *23/08*

U.S. Cl. 66—193 **8 Claims**

1. A basket goal net having an open upper end adapted to be

connected to a goal ring and an open lower end of a smaller opening characterized in that the net is formed from a plurality of netting cords of synthetic fiber, each of the netting cords comprising at least one main yarn having loops formed over the entire length thereof by warp knitting and at least one inlay



yarn having loops formed simultaneously with the loops of the main yarn by warp knitting in the upper half of the netting cord to give that portion of the netting cord a greater thickness and stiffness than the remaining portion of the netting cord, each two adjacent netting cords being joined together at a plurality of locations by warp knitting.

4,413,485

FLANGE FORMING DRILL MEANS

Leo Larikka, Vaasa, Finland, assignor to G. A. Serlachius Oy, Mantta, Finland

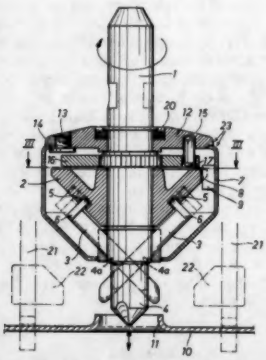
PCT No. PCT/FI81/00007, § 371 Date Sep. 24, 1981, § 102(e) Date Sep. 24, 1981, PCT Pub. No. WO81/02119, PCT Pub. Date Aug. 6, 1981

PCT Filed Jan. 29, 1981, Ser. No. 305,650

Claims priority, application Finland, Jan. 30, 1980, 800279

Int. Cl.³ B21D *51/40*

U.S. Cl. 72—71 **9 Claims**



1. Flange forming drill means for drilling a hole through the side of a pipe or the like and forming a hole encircling flange comprising:

a drill rod mountable on a rotating power source and having a drill bit adjacent a lower end portion,

a plurality of retractable, flange forming members mounted on said lower end portion for forming a flange around the edge of a drilled hole after drilling has been completed, said flange forming members mounted for movement between a retracted position wherein lower ends are contained within an outer surface of said drill bit while said hole is being drilled and an extended position projecting downwardly and outwardly of said surface,

an adjustment element mounted on said drill rod and engaging said flange forming members for moving the same between said extended and retracted positions upon relative rotation between said element and said drill rod,

protective shield means around said adjustment element and said flange forming members mounted in non-rotating engagement with said adjustment element for rotating said element on said drill rod, and

locking means secured to rotate with said drill rod and removably lockable with respect to said adjustment element in a plurality of relative angular positions around the drilling axis of said bit for selectively securing said flange forming members in said retracted and extended positions.

4,413,486

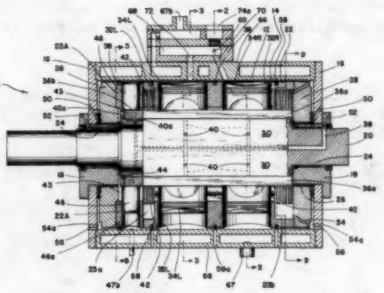
ROTATING CYLINDER EXTERNAL COMBUSTION ENGINE

Everett F. Irwin, 430 Orangewood Dr., Dunedin, Fla. 33528

Filed Mar. 15, 1982, Ser. No. 358,190

Int. Cl.³ F02G *3/02*

U.S. Cl. 60—39.63 **22 Claims**



1. A rotating cylinder continuous external combustion engine, comprising, in combination,

a non-rotatable cylindrically-shaped housing, said housing having fluid flow passage means and fluid intake and discharge ports formed therein,

a co-axially disposed engine block rotatably mounted within said housing,

a synchronously rotatable shaft mounted within said engine block, the rotational axis of the shaft being parallel to the axis of the housing but offset therefrom in fixed spaced relationship therewith,

a plurality of angularly spaced piston chambers formed in said engine block in radially disposed relation to the axis of the housing,

a plurality of pistons, each slideably mounted in a different one of said piston chambers,

said shaft having longitudinally spaced portions journaled within transversely disposed opposite ends of said housing and said rotatable engine block,

said fluid intake and discharge ports being alternately openable and closeable attendant rotation of said engine block,

said pistons operatively engaged by said shaft so that the eccentric mounting of the shaft determines the length of the piston strokes, the improvement wherein:

(a) said rotary block is provided with at least two banks of an even-numbered plurality of at least two diametrically opposed piston chambers in each bank;

(b) said eccentrically disposed rotary shaft having a medial portion provided with an even number of at least two opposed parallel planar faces;

(c) each bank having plural fluid-displacement pistons

which correspond in number to and are respectively operatively disposed within said piston chambers, said pistons having radially innermost ends operably reciprocably engageable with said shaft's corresponding planar faces during rotation thereof;

(d) means disposed interiorly of and apart from said rotary block for operatively interconnecting each pair of diametrically opposed pistons to provide more positive synchronous reciprocative fluid-displacement movement thereto responsive to driven rotation of said shaft, which block and shaft-engageable pistons collectively effect said fluid displacement; and

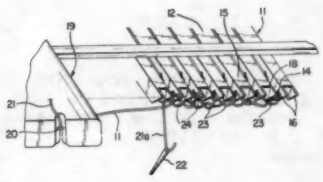
(e) said diametrically opposed pistons being fixedly mounted upon respectively opposed base plates, each of said base plates having at least a bottom planar surface for the complemental reciprocating engagement by a corresponding planar face of said shaft during rotational operation of said device.

4,413,487

HAND-OPERATED KNITTING MACHINE, METHOD OF CASTING ON AND KNIT ARTICLE OBTAINABLE ON THE MACHINE

Yoshimasa Yamaguchi, Kodaira, Japan, assignor to Silver Seiko Ltd., Tokyo, Japan

Filed Jul. 26, 1982, Ser. No. 401,606
Claims priority, application Japan, Jul. 29, 1981, 56-117822
Int. Cl.³ D04B 7/00
U.S. Cl. 66—60 H **4 Claims**



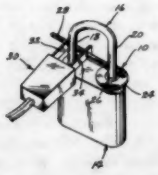
1. A hand-operated knitting machine having a needle bed containing a plurality of knitting needles mounted for individual back and forth movement therein, said needle bed having a plurality of sinker elements secured to an edge thereof and disposed in alternate relationship with said knitting needles, each of said sinker elements being bifurcated at a free end thereof to form a vertically extending, endwise open slot or recess which is sufficient to allow a needle element to pass therethrough.

4,413,488

ELECTRICAL APPLIANCE LOCK

Herbert A. Harmison, Jr., Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Dec. 22, 1980, Ser. No. 219,371
Int. Cl.³ E05B 65/00
U.S. Cl. 70—57 **5 Claims**



1. A locking device for an electrical appliance plug, comprising,

a shackle engaging portion having an opening formed therein for receiving a padlock shackle comprising a U-shaped portion,

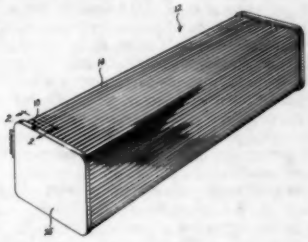
said shackle engaging portion having an elongated member extending therefrom adapted to extend through the openings in at least two prongs of the plug, said elongated member and said plug being positioned on opposite sides of the shackle with at least one of said prongs extending through said U-shaped portion of said shackle.

4,413,489

FURNITURE LOCK

Norman E. Hogue, Niles, Mich., assignor to Packard Industries, Inc., Niles, Mich.

Filed Sep. 18, 1981, Ser. No. 303,211
Int. Cl.³ E05B 65/08, 65/44; E05C 1/02
U.S. Cl. 70—81 **3 Claims**



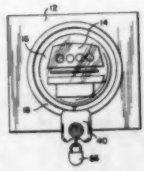
1. A lock for an article with a tamboured cover shiftable within spaced tracks formed in end walls of the article, said lock comprising a cylinder and a pin, said cylinder including a latch and fitted within one end wall of said article and being shiftable within said one end wall between a locked position wherein said latch is extended to engage said one end wall and an open position wherein said latch is retracted, said one end wall having a slot therein intersecting the track in the one end wall, said cylinder carrying said pin, said pin extending into said slot and being shiftable into said one end wall track when said cylinder is in its locked position to contact said cover.

4,413,490

FRONT ENTRY LOCKING RING ASSEMBLY

Anker J. Nielsen, Jr., Holden, Mass., assignor to Omco Inc., Holden, Mass.

Filed Mar. 1, 1982, Ser. No. 353,591
Int. Cl.³ B65D 55/14
U.S. Cl. 70—164 **10 Claims**



1. A front entry meter locking ring assembly for locking electric meters and the like comprising:

(a) a split locking ring having a U-shaped cross-section, said locking ring having a circular portion adapted to clamp the glass bowl flange to the meter receptacle flange;

(b) said locking ring having two substantially parallel downturned legs, said legs being substantially equal in length for ease of being manually squeezed together during initial positioning and fastening of said locking ring over the

flanges of the glass bowl and the meter receptacle, said downturned legs having U-shaped cross-sections and having opposed and aligned apertures through which is mounted a take-up fastener for drawing said two legs towards each other;

(c) a lock receptacle affixed to the interior of one of said legs, said lock receptacle having a hollow cylindrical body which has an axis which is parallel to the axis of said circular portion of said locking ring, said lock receptacle cylindrical body having a round front opening and having interior locking ball retaining means for permitting the insertion of an unlocked barrel lock and for preventing the withdrawal of a locked barrel lock;

(d) a removable substantially unbreakable housing for enclosing and securely shielding said locking ring legs and their associated elements against unauthorized entry, said housing adapted to be moved into its locking position by being fitted over said locking ring legs and positioned closely adjacent to the lower circumference of said locking ring circular portion, said housing when in its locking position having a round front aperture in axial alignment with said lock receptacle round front opening, said housing front aperture being sized and shaped to accept with a relatively close fit the full insertion of a barrel lock, the rear face of the inserted barrel lock being relatively flush with the outer rim of said housing front aperture thereby substantially preventing malicious deformation of said housing over the rear face of a locked barrel lock, said housing also having a bottom aperture; and

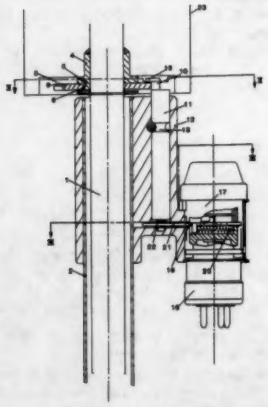
(e) an elongated sealing tab extending substantially vertically through said housing bottom aperture when said housing is in its locking position, retaining means for fixing said sealing tab against downward movement relative to said locking ring, and a tell-tale seal affixed to said sealing tab below said housing bottom aperture, said tell-tale seal sized and shaped sufficiently large to prevent undetectable passage of said housing bottom aperture over it.

4,413,491

ANTI-THEFT DEVICE FOR THE STEERING COLUMN OF AN AUTOMOBILE

Andre Thirion, Dijon, France, assignor to Antivols Simplex, Apollinaire, France

Filed May 12, 1981, Ser. No. 262,907
Claims priority, application France, Jun. 6, 1980, 80 12562
Int. Cl.³ B60R *25/02*; G05G *5/06*
U.S. Cl. 70—252 **3 Claims**



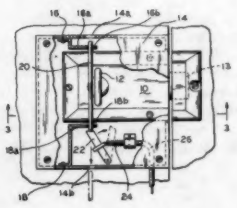
1. An anti-theft device for locking the steering shaft of a vehicle against rotation wherein the steering shaft extends colinearly through a hollow steering column and is mounted for relative rotation with respect thereto comprising, a crown gear mounted on said steering shaft by a mounting means so that it is rotatable with said steering shaft with respect to said steering column and rotatable with respect to said steering shaft through a predetermined arc, said crown gear comprising radially projecting teeth and concave sections between said teeth each having at least a partly circular profile, means to resiliently urge said crown gear into a median position within said predetermined arc, a locking element support member rigidly attached to said steering column, an elongated cylindrical locking spindle rotatably mounted in said support member with its longitudinal axis of rotation extending substantially parallel to said steering shaft, a control element operably engaging said spindle to impart and control the rotation thereof, a lock mounted on said support member operably engaging said control means to control the operation thereof, and a locking element on said spindle adjacent said crown-gear comprising a locking finger in the form of a segment of a cylinder rotatable with said spindle having a radially outer part circular face of substantially the same radius as said partly circular profile of said concave sections of said crown gear, said outer face being positioned with respect to said crown gear so that when said lock is in the unlocked position, said face and segment are entirely removed from engagement with said concave sections and teeth to allow rotation of said crown gear and when said lock is in the locked position, said face of said segment engages said partly circular profile of one of said concave sections to thereby prevent rotation of said crown gear and steering shaft.

4,413,492

DEADBOLT LOCK PROTECTOR

R. L. Strange, 944 London St., Menasha, Wis. 54952

Filed Oct. 1, 1981, Ser. No. 307,755
Int. Cl.³ E05B *13/00*
U.S. Cl. 70—416 **8 Claims**



1. A deadbolt lock protector, for protecting a conventional, single cylinder deadbolt lock having a thumblatch which is in the vertical position when locked and a spring-loaded wedge-type bolt, allowing the door on which the lock is mounted to be closed when the bolt is in its protruding position, comprising:

an enclosure, of sufficient size to cover the lock completely, affixed to the door covering the lock;

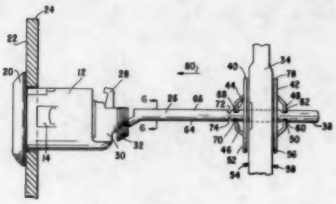
means for preventing the thumblatch from turning from its locked position, even when a key is inserted from the outside;

said preventing means including a pin secured vertically alongside the thumblatch to prevent it from turning, brackets secured inside said enclosure to hold said pin from moving horizontally, and a support member also inside said enclosure to hold said pin from moving vertically; and means for releasing said preventing means, so that the thumblatch may then be turned from its locked position.

4,413,493
FRANGIBLE LOCK APPARATUS

Edward Meinsen, 1126 E. 43rd St., and James Ferretti, 1895 Albany Ave., both of Brooklyn, N.Y. 11210

Filed Jan. 5, 1981, Ser. No. 222,350
Int. Cl.³ E05B *15/16, 63/00*
U.S. Cl. 70—422 6 Claims

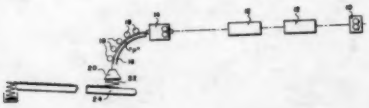


1. A frangible lock apparatus comprising a tumbler, a housing, said tumbler journaled for rotation within said housing, a non-circular shaft, one end of said non-circular shaft coupled for rotation with said tumbler, a locking mechanism, said locking mechanism having an opening for receiving a portion of said non-circular shaft therein, a pair of pan-shaped washers, said locking mechanism having opposed lateral surfaces, each of said pair of pan-shaped washers having a brim portion and a pair of opposed jaw-like tines, said jaw-like tines having free ends, said free ends of said jaw-like tines disposed in opposed spaced apart relationship, said non-circular shaft having a first pair of notches and a second pair of notches and a third pair of notches, one of said pair of pan-shaped washers being disposed having said brim portion thereof adjacent to one of said opposed surfaces, the other of said pair of said pan-shaped washers having said brim portion thereof disposed adjacent the other of said pair of pan-shaped washers engaging said first pair of notches, said free ends of said other pan-shaped washers engaging said second pair of notches, said third pair of notches being disposed at a location immediately adjacent to said second pair of notches and disposed intermediate said locking mechanism and said housing, wherein said non-circular shaft is breakable in the region of said third pair of notches, upon the application of force exerted in tension upon said non-circular shaft.

4,413,494
PINCH ROLL SYSTEM FOR VERTICAL LAYING HEADS

Martin Gilvar, Oakham, and Philips Wykes, Worcester, both of Mass., assignors to Morgan Construction Company, Mass.

Filed Feb. 13, 1981, Ser. No. 234,115
Int. Cl.³ B21D *7/08*
U.S. Cl. 72—167 10 Claims



1. In a rolling mill wherein hot rolled rod is directed along a downwardly curved path into a vertical laying head which forms the rod into a series of rings, a method of propelling the rod along said path and through the laying head comprising:

directing the rod between a pair of driven pinch rolls located in advance of said path, said pinch rolls having means associated therewith for accommodating roll parting adjustments,

exerting an initial closing force on said pinch rolls to establish an initial parting prior to entry of a rod front end therebetween, said initial parting being sized to produce at least some rod deformation while providing a driving relationship between said pinch rolls and said rod, said initial closing force being greater than the momentary surge in separating force accompanying impact of a rod front end with said pinch rolls;

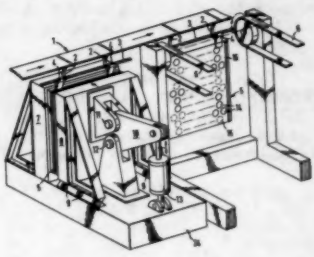
maintaining said initial closing force and said initial parting until the rod front end has passed along said path through the laying head, and

thereafter releasing said initial closing force to allow said rod to force said pinch rolls apart to a secondary parting at which said rod deformation is eliminated while said driving relationship continues to be maintained.

4,413,495
METHOD FOR THE STIFFENING AND STRAIGHTENING OF STARTING SHEETS

Eino J. Peuhkurinen, Kokkola; Erkki J. Linnanketo, Pori; Kari M. U. Färm, Vantaa; Tuomo V. J. Kivistö, Espoo; Tauno T. Koho, Helsinki; Seppo T. Kinnunen, and Martti P. Taskinen, both of Espoo, all of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Mar. 2, 1981, Ser. No. 239,677
Claims priority, application Finland, Mar. 3, 1980, 800647
Int. Cl.³ B21D *13/02, 13/04, 31/06, 43/00*
U.S. Cl. 72—196 6 Claims



1. A method for producing a stiffened and straightened starting sheet of the type having a major planar surface area, a sheet thickness of approximately 0.4 to 1.2 mm and a stiffening pattern projecting at maximum approximately 2.5 mm from the plane defined by said planar surface area and provided with suspension lugs attached to one sheet edge, comprising first attaching said suspension lugs to the sheet, then suspending the sheet from said lugs in a vertical orientation and continuing to suspend the sheet from said lugs while rolling or pressing the sheet to produce said stiffening pattern therein and to simultaneously align said plane with said lugs to assure that the sheet produced will hang straight down from said lugs.

4,413,496
METHOD OF MAKING FLANGED TRACK TRACTOR ROLLER FOR OFF-HIGHWAY EQUIPMENT

Donald J. Diemer, 4355 Brendan La., North Olmsted, Ohio 44070, and Ralph D. Dello, R.D. 1 Susan Trace, New Wilmington, Pa. 16142

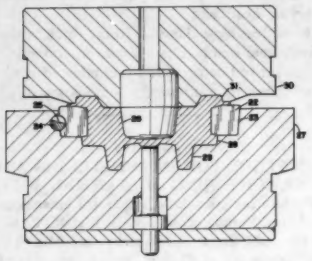
Continuation-in-part of Ser. No. 2,851, Jan. 12, 1979, Pat. No. 4,294,101. This application Oct. 13, 1981, Ser. No. 311,003
Int. Cl.³ D21D *22/00*; B21K *1/28*
U.S. Cl. 72—356 13 Claims

1. A closed die forging apparatus to produce a forged roller or its equivalent, comprising:

A. a bottom die cavity consisting of a generally circular first cavity;

B. a step in said cavity for a smaller diameter cavity immediately below said first cavity;

C. a split ring in said first cavity projecting inwardly and forming a cavity of lesser diameter than said step cavity;
D. a top die cavity consisting of a generally circular second cavity of a diameter approximating that of said step cavity but of lesser diameter than said first cavity; and
E. said top die cavity having a plunger which extends into



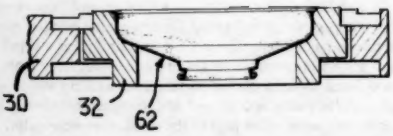
said bottom die cavity and forms a central cavity and said bottom die having a portion centrally thereof which projects near the plunger, whereby the closing of said top and bottom die cavities produces a roller or its equivalent and includes at least two flanges, one of which is formed by the step cavity and the other of which is formed by the top die closing of said bottom die near said split rings.

4,413,497

METHOD OF FORMING DOMED END FOR CONTAINER

Charles S. Kubis, Weston, Conn., and John Walter, Evergreen Park, Ill., assignors to Continental Can Company, Inc., Stamford, Conn.

Filed Sep. 21, 1981, Ser. No. 304,121
Int. Cl.³ B21D *22/00*
U.S. Cl. 72—356 **10 Claims**



1. A method of forming a domed end for a container body, said method comprising the steps of initially shaping a flat blank to a generally cup-shaped blank having at its open end a radially outwardly directed surrounding flange with a free and final peripheral edge, utilizing said flange as a support for the end during subsequent forming operations, and then reshaping said flange for securement of said domed end to the container body.

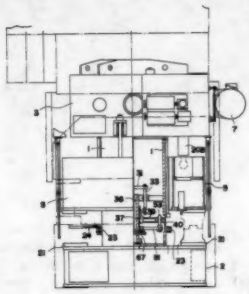
4,413,498

ROTARY TRANSFER PRESS

Hiroshi Imaoka; Michio Sakiyama, both of Nara, and Masahiro Yamamoto, Sakai, all of Japan, assignors to Hitachi Shipbuilding & Engineering Company Limited, Osaka, Japan

Filed Feb. 9, 1982, Ser. No. 347,101
Claims priority, application Japan, Feb. 24, 1981, 56-24601; Jul. 20, 1981, 56-108455[U]; Sep. 25, 1981, 56-142971[U]
Int. Cl.³ B21J *11/00*
U.S. Cl. 72—405 **7 Claims**

1. A rotary transfer press comprising a bed; an upright extending upward from the bed, a crown mounted on the upright and providing a plurality of stations between the crown and the bed in an annular arrangement; a slide upwardly and downwardly movably guided on said upright; a feed bar having clamping means corresponding in number to the number of the stations and provided around the upright for transferring workpieces from station to station in succession; slide drive means disposed in the crown and connected to said slide for moving the slide upward and downward and comprising a main shaft coupled to a main electric motor to rotate at a



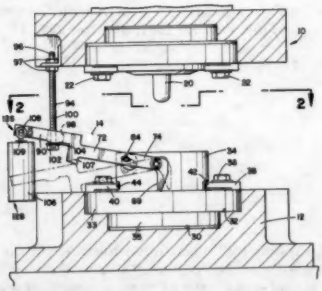
reduced speed, a plurality of eccentric rings coupled to the main shaft to rotate at a reduced speed and connecting rods connecting the eccentric rings to the slide; feed bar lifting drive means having a lift cam coupled to the slide drive means and actuated by the lift cam for moving the feed bar upward and downward; feed bar feeding-driving means having a feed cam coupled to the slide drive means and actuated by the feed cam; and clamp drive means having a clamp cam coupled to the slide drive means and actuated by the clamp cam for operating the clamping means.

4,413,499

ROLLING KEY LOCK FOR FORGING DIE AND PRESS

Donald J. Diemer, 4355 Brendan La., North Olmsted, Ohio 44070, and Ralph D. Delio, R.D. #1 Susan Trace, New Wilmington, Pa. 16142

Filed Oct. 13, 1981, Ser. No. 311,004
Int. Cl.³ B21J *13/00*
U.S. Cl. 72—446 **12 Claims**



1. A forging press including a die lock comprising:
a forging base including a die socket, said socket having an inner sidewall slot;
a ram including a plunger;
a die received in said die socket and including a mating slot disposed for mating alignment with said sidewall slot;
a rolling key received in said sidewall slot and said mating

slot comprising an elongated bar including an intermediate undercut portion, and a connecting member eccentrically secured to one terminal end of said bar; and

a lever, one end portion of said lever operatively engaging said connecting member for rotation of said rolling key upon selective operation of said lever, and a second end portion of said lever operatively engaging said ram for operation of said lever upon selective advancement and retraction of said ram.

4,413,500

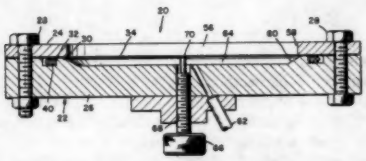
TOOL FOR FORMING PRECISELY CURVED SURFACES

Jon H. Myer, Woodland Hills, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Division of Ser. No. 106,985, Dec. 26, 1979. This application Sep. 13, 1982, Ser. No. 417,756

Int. Cl.³ B21B *25/00*

U.S. Cl. 72—465 **5 Claims**



1. A tool useful in the method of forming precisely curved surfaces comprising:

a holder having a central space and a pair of first and second clamping surfaces placed about the space for retaining therebetween a blank at its periphery and for freely supporting the blank in the space;

a recess in at least one of said surfaces having a given depth and width and positioned equally around the space;

at least one O-ring having a thickness greater than the recess depth and smaller than the recess width and residing in the recess against a wall thereof closest to the central space of said holder so that, when said clamping surfaces are moved together with said blank positioned therebetween, said O-ring is compressed and forced to move outwardly from the central space within said recess and to frictionally drag said blank at its periphery also outwardly from the central space for stretching said blank.

4,413,501

APPARATUS FOR PRESSURE TESTING TUBING

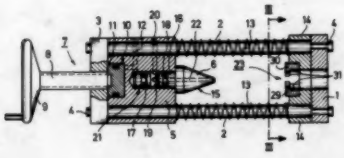
Peter Schröck, Im Vogelsang 5, D-6000 Frankfurt am Main, Fed. Rep. of Germany 90

Filed Aug. 31, 1981, Ser. No. 298,046

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1980, 3009168

Int. Cl.³ G01M *3/04*

U.S. Cl. 73—49.6 **10 Claims**



1. Apparatus capable of use in pressure testing flexible tubing ending with a metal connector, comprising:

a first and a second support member;

means mounting the first support member for movement towards and away from the second support member;

a spigot on the first member and having a conical face for coaxial insertion into the end of the metal connector when the first support member is moved toward the second support member;

mechanical means for so moving the first support member;

pressure drive means disposed in the first support member and connected between the spigot and the mechanical means for moving the spigot away from the mechanical means and into sealing engagement with the end of the metal connector;

a duct through the spigot for introducing pressure-testing fluid into the flexible tubing; and

holding means on the second support member for holding the metal connector with the end thereof facing the spigot, the holding means comprising two clamp members each pivotally mounted on the second support member for closing movement about the metal connector.

4,413,502

GAS DETECTING SENSOR

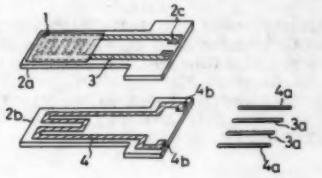
Minoru Ohta; Yutaka Hattori, both of Okazaki; Tomio Kawakami, Nishio, and Michitoshi Onoda, Toyohashi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Feb. 26, 1982, Ser. No. 352,562

Claims priority, application Japan, Apr. 27, 1981, 56-63625; Nov. 30, 1981, 56-192476

Int. Cl.³ G01N *27/12*

U.S. Cl. 73—23 **12 Claims**



1. A gas detecting sensor for detecting the partial pressure of oxygen gas contained within exhaust gases dishcarged from an engine, comprising:

a sensing element having such an electrical characteristic that the electrical resistance thereof changes in response to the partial pressure of oxygen gas;

said sensing element being formed of alloy ceramic material composed of 20 to 60 mol percent of cobalt monoxide, 20 to 60 mol percent of magnesium monoxide and 10 to 50 mol percent of nickel monoxide;

a base member formed of ceramic material for supporting said sensing element;

said base member being mounted to an exhaust passage of said engine so as to be exposed to said exhaust gases; and

an electric current conducting means for supplying an electric current to said sensing element;

one end of said electric current conducting means bein electrically connected to said sensing element.

4,413,503

METHOD OF DETECTING LEAKS IN A LARGE STORAGE TANK

Edgar S. Olivieri, Summit Hills, P.R., assignor to Texaco Puerto Rico Inc., San Juan, P.R.

Filed Apr. 5, 1982, Ser. No. 365,752

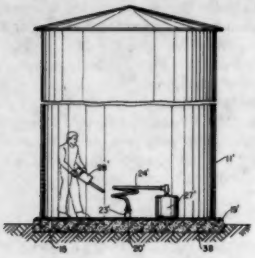
Int. Cl.³ G01M *3/20*

U.S. Cl. 73—40.7 **8 Claims**

8. Method of detecting leaks in bottom plate of a large storage tank having said bottom plate resting on a foundation, comprising the steps of

applying an asphalt seal to the periphery of said bottom plate at said foundation against gas leakage from under said bottom plate at the edges thereof,

installing a gas-tight union on the inside of said bottom plate,
drilling a hole through said bottom plate inside said union,
coupling a pressurized tank of flourinated hydrocarbon to said union for feeding said flourinated hydrocarbon in gaseous



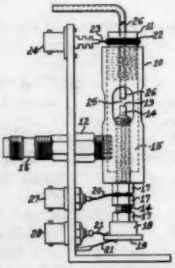
form through said hole to the underside of said bottom plate, and
scanning the upper side of said bottom plate by manually moving a halogen detector over said bottom plate inside said large storage tank.

4,413,504

LIQUID-PHASE CHROMATOGRAPHY DETECTOR

Edward G. Voigtman; James D. Winefordner, and Arthur R. Jurgensen, all of Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.

Filed May 27, 1982, Ser. No. 382,633
Int. Cl.³ G01N *31/06*
U.S. Cl. 73—61.1 C **19 Claims**



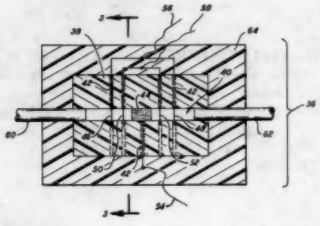
1. A liquid-phase chromatography detector comprising a flow cell having an inlet tubular conduit for receiving a liquid chromatographic effluent and discharging it as a flowing columnar stream onto a vertically adjustable receiving surface spaced apart from and located vertically below and in close proximity to the discharge end of said conduit; a receiver adapted to receive liquid overflowing from said receiving surface; means for continuously removing liquid from said receiver; means for focussing fluorescence-producing light pulses on said flowing columnar stream as it passes from said conduit to said receiving surface and means to detect the produced fluorescence; means for focussing light pulses on said flowing columnar stream as it passes from said conduit to said receiving surface so as to produce acoustic waves in said stream and piezoelectric transducer means to detect those waves; and means to produce ionization of said liquid effluent passing through said flow cell so as to produce photocurrents therein and electrical means to detect said photocurrents.

4,413,505

ELECTROCHEMICAL FLOW CELL, PARTICULARLY USE WITH LIQUID CHROMATOGRAPHY

Wayne R. Matson, Ayer, Mass., assignor to Environmental Sciences Associates, Inc., Bedford, Mass.

Filed Mar. 9, 1981, Ser. No. 241,945
Int. Cl.³ G01N *27/30*
U.S. Cl. 73—61.1 C **20 Claims**



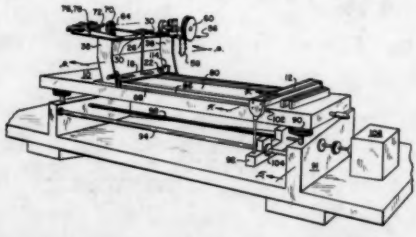
1. An electrochemical flow cell for treating a sample solution, said cell comprising:
a holder assembly defining a flow path and having an inlet for directing a stream of said solution into said cell, and an outlet for directing treated solution from said cell;
a plurality of electrode elements arranged in said holder, said electrode elements being operatively disposed, electrically insulated from one another, within said flow path, said plurality including at least one active testing electrode, at least one reference electrode and at least one counter electrode;
said flow cell being encapsulated within a higher impact, chemically resistant, electrically insulating material, with said flow path extending through said encapsulation; and,
a pair of high pressure resistant fittings communicating with said flow path.

4,413,506

HORIZONTAL FILM BALANCE HAVING WIDE RANGE AND HIGH SENSITIVITY

Bernard M. Abraham, Oak Park; Kenjiro Miyano, Downers Grove, and John B. Ketterson, Evanston, all of Ill., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Mar. 5, 1981, Ser. No. 240,647
Int. Cl.³ G01N *13/02*
U.S. Cl. 73—64.4 **10 Claims**



1. In a horizontal film balance having a receptacle for a liquid substrate upon which a thin film is suspended, a balance instrument comprising:
a float disposed to contact the liquid substrate and the thin film;
means for applying a force to said float through the thin film;

bearing means for mounting said float for movement in response to forces being applied to said float;

a horizontal arm having at least one end portion attached to said bearing means for movement in response to movement of said float;

feedback positioning means for maintaining the end portion of said horizontal arm in a fixed vertical position, said feedback positioning means including force restoring means which balance forces applied to said float; and

means for measuring the restoring force.

4,413,507

METHOD AND ARRANGEMENT FOR DETERMINING TOOL WEAR

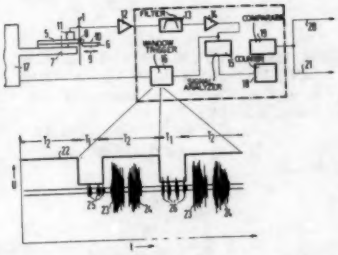
Jeffrey-Michael Drew; Max-Gerhard Seitz, both of Munich; Hans-Peter Kehrer, Unterhaching, and Gottfried Eichelbroenner, Berlin, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 7, 1981, Ser. No. 291,093

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1980, 3029957

Int. Cl.³ G10N *19/00*

U.S. Cl. 73—104 **7 Claims**



1. A tool wear monitoring device for monitoring wear of a cutting tool, comprising:

a sound pick-up means coupled to the cutting tool for creating output signals responsive to cutting noises associated with the cutting tool during operation;

window trigger means connected to control the output signals for excluding friction noises associated with the cutting tool while permitting the cutting noises to pass through;

signal analyzer means connected to receive the output signals as controlled by the window trigger means for evaluating a magnitude of the cutting noises in comparison to a predetermined threshold level beyond which the cutting tool is considered to be blunt; and

the window trigger means selecting the cutting noises for passage therethrough by sensing a physical movement of at least a portion of the cutting tool.

4,413,508

ADJUSTING SYSTEM FOR CRANK ANGLE SENSOR

Yoshihisa Kawamura, and Seishi Yasuhara, both of Yokosuka, Jepan, assignors to Nissan Motor Company, Ltd., Yokohama, Japan

Filed Sep. 8, 1981, Ser. No. 300,101

Claims priority, application Japan, Sep. 9, 1980, 55-125160

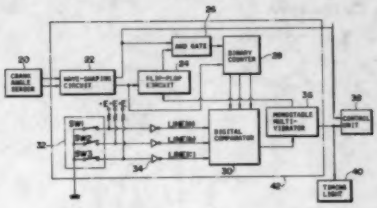
Int. Cl.³ G01M *15/00*

U.S. Cl. 73—116 **19 Claims**

1. An adjusting system for internal combustion engines comprising:

first means associated with an engine crankshaft for producing first and second pulse signals, said first signal being indicative of a predetermined crankshaft position for each engine cylinder and said second signal being indicative of rotation of the engine crankshaft through a predetermined unit angle;

second means applied with said first and second signals from said first means for adjusting said first signal to provide a third pulse signal; and



third means for measuring the difference between an actual value and a target value with respect to a desired timing, said actual value of the desired timing being variable corresponding to a change in a pulse phase of said third signal;

said adjustment of the first signal being done to eliminate said difference between the actual and target values.

4,413,509

COMBUSTION PROCESS PARAMETER SENSOR

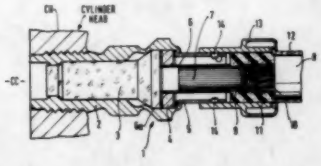
Winfried Moser, Markgröningen; Klaus Müller, Tamm, and Franz Rieger, Aalen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 20, 1981, Ser. No. 313,359

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1980, 3045721

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—117.3 **7 Claims**



1. Combustion process parameter sensor to determine, simultaneously, pressure and optical physical effects of combustion processes within the combustion space of a combustion chamber (CC) of an internal combustion engine (CH) having

a housing (1, 2),

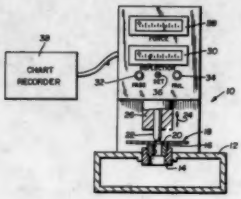
and, within the housing, the combination of a light guide means (3, 7) extending through the housing to transmit light from the interior of the combustion chamber during operation of the engine,

with a pressure sensing means (4) located in the housing and exposed to the combustion chamber to measure pressures occurring in the chamber as the light guide means transmits light signals from the interior of the combustion chamber and to permit simultaneous evaluation of pressure and light phenomena during combustion within the combustion chamber.

4,413,510
COATING ADHESION TESTING

Joseph H. McCusker, Princeton; Barry J. Thaler, Plainsboro, and Wei H. Tsien, Cherry Hill, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 19, 1981, Ser. No. 323,057
Int. Cl.³ G01N 19/04
U.S. Cl. 73—150 A 3 Claims

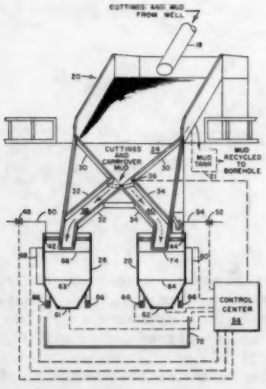


1. A method of testing the adhesion of a coating to a substrate comprising the steps of:
supporting the substrate against motion in a given direction,
biasing a force applying member against the coating,
increasing the force,
measuring the force and the deflection caused by the force-applying member, and
terminating the test when the rate of deflection as a function of increasing force decreases.

4,413,511
SYSTEM FOR MEASURING CUTTINGS AND MUD CARRYOVER DURING THE DRILLING OF A SUBTERRANEAN WELL

John K. Godbey, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 12, 1982, Ser. No. 357,516
Int. Cl.³ E21B 49/08
U.S. Cl. 73—155 8 Claims



1. A method for continuously determining the amount of solid cuttings in a drilling mud discharged from a well drilling operation and the amount of mud carried over with the solid cuttings during separation of the cuttings from the drilling mud, comprising the steps of:
(a) measuring the density of the solid cuttings in said drilling mud;
(b) measuring the density of said drilling mud;
(c) passing the drilling mud discharged from the well through a shale shaker to remove the solid cuttings and mud carried over with the cuttings from the drilling mud;
(d) returning the drilling mud devoid of cuttings separated by the shale shaker to the well drilling operation;
(e) withdrawing said solid cuttings and carryover mud separated by the shale shaker and constantly measuring the weight and volume of said cuttings and carryover mud;
(f) constantly determining the volume fraction of said cuttings ϕ_c in accordance with the formula:

$$\phi_c = \frac{W_t/V_t - p_m}{p_c - p_m}$$

where:
W_t is the total weight of a fixed volume of solid cuttings and carryover mud,
V_t is the total volume of solid cuttings and carryover mud,
p_m is the density of drilling mud, and
p_c is the density of cuttings; and
(g) constantly determining the volume fraction of said carryover mud ϕ_m in accordance with the formula:

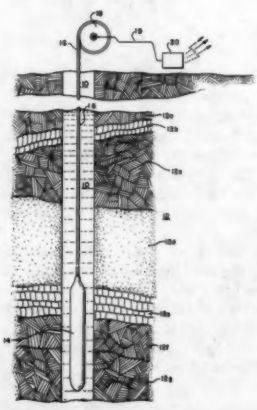
$$\phi_m = 1 - \phi_c$$

where: ϕ_c = volume fraction of solid cuttings determined in step (f).

4,413,512
METHOD OF LOCATING POTENTIAL LOW WATER CUT HYDROCARBON RESERVOIRS

Joseph Zemanek, Jr., Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 4, 1982, Ser. No. 336,743
Int. Cl.³ E21B 49/00
U.S. Cl. 73—152 9 Claims



1. A method for identifying potential low water cut hydrocarbon reservoirs in a geological formation having significant water saturation comprising the steps of:
traversing a length of a borehole through said formation with a logging tool;
generating with said logging tool during said traversing step a first set of signals representing the formation water saturation;
determining from said first set of signals, the water saturation of the formation along said length;
sampling the formation rock at a level at which water saturation is significant;
measuring the surface area of the sampled formation rock by nuclear magnetic resonance;

determining the irreducible water saturation at said level of the formation from the measured surface area of the sampled formation rock; and

plotting the irreducible water saturation and the log determined water saturation of the formation at said level to produce a log which can be compared to identify a level at which said irreducible water saturation approximates or exceeds the corresponding log determined water saturation as a potential region where hydrocarbons may be produced without significant attendant water production.

4,413,513

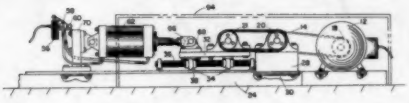
MACHINE FOR TESTING CHAIN AND SPROCKET TYPE DRIVE SYSTEMS

Michael O. Ross, 14111 Laterna La., Houston, Tex. 77083, and Kurt M. Marshek, 9701 Courtleigh Cir., Austin, Tex. 78759

Filed Jun. ?. 1981, Ser. No. 268,759

Int. Cl.³ G01M *13/02*

U.S. Cl. 73—162 **10 Claims**



1. An apparatus for measuring and testing chain wear elongation and determining power capacity of a chain-sprocket drive system and other transmission systems, the apparatus comprising a base frame which can indirectly support chains and sprockets under test; a driving sprocket shaft; a moveable sprocket shaft means; a cylinder mounted substantially parallel to the chains to apply load to said chain sprocket drive system; means for attaching said cylinder to the base frame; a linear bearing plate attached to said cylinder through which load is applicable to two test chains and four sprockets under test in one instance; a motor mounted on said base frame, having a rotatable shaft; means for coupling said rotatable motor shaft to a driving sprocket shaft for developing a torque on said driving sprocket shaft means urging the same to rotate relative to said base frame and can hence apply power to overcome friction in the chain-sprocket drive system under test; said torque being transmittable via the chains and sprockets between said driving sprocket shaft and a movable sprocket shaft means which permits rotation of said movable shaft to occur without rotation of said base frame; speed sensing means for sensing the rotational speed of sprockets; and counting system means for counting rotation of the said movable shaft located on said linear bearing plate and an elongation sensing switch to stop drive system operation of said drive system if chain elongation exceeds a fixed amount; a clevis and chain load measuring system comprised of strain gages which form a Wheatstone bridge and measure strain in said clevis through which load is applied to the chains; and a noncontact temperature measuring system to determine the temperature of chains and sprockets during operation; and a lubrication system comprised of a gravity feed and brush for wiping lubricant on the test chains and an environmental and safety cover for protecting the operation as well as for enclosing the chain drive system.

4,413,514

AIR FLOW SENSOR

William W. Bowman, Dallas, Tex., assignor to Hoffman Controls Corporation, Dallas, Tex.

Filed May 22, 1981, Ser. No. 266,487

Int. Cl.³ G01F *1/68*

U.S. Cl. 73—204 **8 Claims**

1. Apparatus for positioning within a slowly moving fluid medium for sensing fluid flow velocity therethrough, comprising:

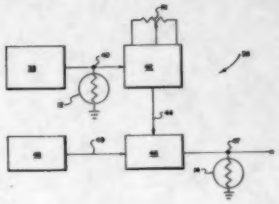
(a) a tubular housing having intake and outlet ends;

(b) turbulence reducing means within said housing for reducing fluid flow turbulence to an acceptable level;

(c) a first thermistor disposed outside of said tubular housing;

(d) a first current supply for supplying constant current to said first thermistor to develop a voltage across said first thermistor which is proportional to the ambient temperature of the fluid medium outside said housing;

(e) a second thermistor disposed within said tubular housing;



(f) a second current supply responsive to the voltage across said first thermistor for supplying current to said second thermistor, which current is proportional to the ambient temperature of the fluid medium outside said housing,

whereby the voltage across said second thermistor is a function only of the temperature change of said second thermistor, independent of changes in the ambient temperature of the fluid outside said housing.

4,413,515

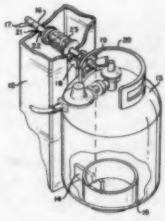
BARBECUE FUEL LEVEL GAUGE

Leonard L. Quinn, Barrie, Canada, assignor to Dart Industries Inc., Northbrook, Ill.

Filed Aug. 14, 1981, Ser. No. 293,037

Int. Cl.³ G01F *23/20*

U.S. Cl. 73—296 **4 Claims**



1. A fuel level gauge for a barbecue fuel tank including, in combination with a pedestal of a barbecue:

(a) support means adjacent to a lower end of said pedestal for engaging under a bottom edge portion of the barbecue fuel tank such that the tank tends to tilt away from the pedestal;

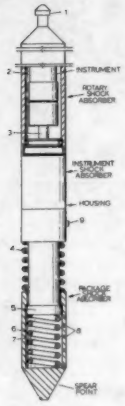
(b) a gauge comprising an elongated member located transversely relative to said pedestal, said elongated member having an end which engages a top portion of said fuel tank, said elongated member being slidably affixed to said pedestal adjacent to the top portion of said fuel tank to permit movement of said elongated member along a direction of its length transversely relative to said pedestal; and,

(c) spring means opposing the tendency of said tank to tilt away from said pedestal so that the degree of tilt is a function of the weight of the tank and therefore the amount of fuel in the tank, the transverse position of said gauge relative to said pedestal thereby serving as a measure of the fuel level in said tank.

4,413,516
OIL WELL SERVICE TOOL

Robert E. Croom, Jr., Lafayette, and John D. Jeter, St. Martinville, both of La., assignors to Oil-Well Drilling Control, Inc., Broussard, La.

Filed Mar. 19, 1982, Ser. No. 360,108
Int. Cl.[3] G01D *11/24*
U.S. Cl. 73—431 10 Claims



1. In a well bore survey instrument package to be lowered into and retrieved from a pipe bore situated in an earth bore hole, shock damping apparatus to reduce shock to an instrument contained within the package comprising:

an enlongated generally cylindrical housing having an upper and a lower end, a sealed enclosure, and a generally central longitudinal axis;

a well bore survey instrument situated in said enclosure, mounted for axial movement from a first upper position to a second lower position along said central axis;

a fluid filled dashpot cylinder interposed between said housing and said instrument, situated for telescoping movement along said central axis from said first position to said second position in sympathy with axial movement of said instrument;

means to force fluid movement from at least part of said dashpot cylinder in reponse to telescoping movement;

a variable area flow restriction means to regulate flow of fluid from said dashpot cylinder in response to telescope position of said dashpot;

means responsive to the telescope position of said dashpot to vary the area of said flow restriction;

a variable volume container means in communication with said dashpot to receive, contain, and return fluid moving from and back to said dashpot; and

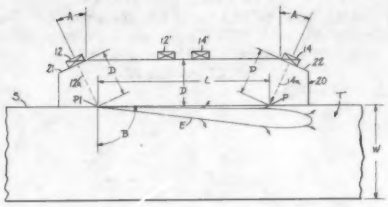
bias means to return said instrument and said dashpot to the first upper position;

whereby the change in velocity of an instrument may be controlled to distribute acceleration forces evenly over the acceleration run to minimize peak acceleration forces imposed upon the instrument.

4,413,517
APPARATUS AND METHOD FOR DETERMINING THICKNESS

Robert A. Soden, Trenton, N.J., assignor to Sonic Instruments, Inc., Trenton, N.J.

Continuation of Ser. No. 61,610, Jul. 30, 1979, abandoned. This application Dec. 24, 1980, Ser. No. 219,601
Int. Cl.[3] G01N *29/00*
U.S. Cl. 73—597 8 Claims



1. A method of measuring the thickness of a test piece with sonic energy, comprising the steps of:

(A) providing a member of different material than said test piece, said member having;

(i) spaced apart angular surfaces approaching an angle complementary to the first critical angle of refraction of said test piece, each said angular surface adapted to receive a transducer,

(ii) an upper surface disposed between said angular surfaces and

(iii) a bottom surface;

(B) acoustically coupling said member to the surface of said test piece;

(C) positioning a first transducer upon one of said test piece angular surfaces such that the critical angle of refraction of said test piece is approached;

(D) positioning a second transducer upon the other of said test piece angular surfaces at the same critical angle from said test piece surface so that the axes of said first and second transducers intersect said test piece surface to define a known dimension along said test piece surface;

(E) exciting said first transducer to provide a sonic subsurface wave in said test piece substantially parallel to said test piece surface;

(F) measuring the time of transmission of said sonic wave between said first and said second transducers;

(G) calculating the velocity of said sonic wave in said test piece;

(H) positioning a third transducer on said member upper surface, the distance between said member upper surface and said member bottom surface being equal to the distance of said first transducer, measured along the axis of said first transducer, to the intersection of said first transducer axis with said member bottom surface;

(I) exciting said third transducer to transmit an ultrasonic pulse in said member and said test piece;

(J) detecting an echo pulse from the bottom side of said test piece; and

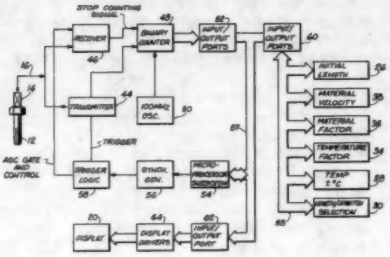
(K) measuring the thickness of said test piece by determining the round trip transit time of a sonic pulse and echo in said test piece.

4,413,518

APPARATUS AND METHOD FOR MEASURING THE EXTENSION OF BOLTS UNDER STRESS

Robert L. Jones, La Habra, Calif., assignor to NDT Instruments, Inc., Huntington Beach, Calif.

Filed Jul. 20, 1981, Ser. No. 284,761
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—615 **51 Claims**



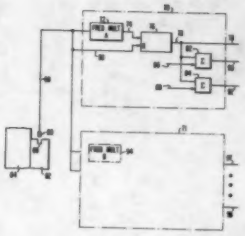
1. A bolt length measurement apparatus comprising:
an acoustic energy pulse transmitter,
an acoustic energy pulse reciever,
a transducer connected to said transmitter and to said receiver for imparting a transmitted acoustic energy pulse into a bolt and for responding to a reflected echo acoustic energy pulse from a bolt,
a high frequency oscillator for generating a plurality of timing pulses of a constant repetition period,
a couter for counting and registering said timing pulses,
gating means having an input connected to said oscillator, an output connected to said counter, and a gate control terminal connected to said transmitter and receiver for starting said counter in response to a transmitted pulse and stopping said counter in response to a received echo pulse,
calculating means connected to said counter for receiving a registered count indicative of the number of timing pulses counted by said counter between said occurrence of each transmitted pulse and each subsequent received echo pulse,
input factor means connected to said calculating means and providing means for inputting at least one factor into said calculating means,
said calculating means being capable of utilizing said registered timing pulse count and said input factor for generating a signal representative of a length parameter of a bolt,
display means connected to said calculating means for displaying said length parameter,
means for receiving a selected plurality of said pulse counts serially generated by said counter in response to a corresponding plurality of transmitted acoustic energy pulses and received echo pulses,
means for determining whether each of said received pulse counts differs from each pulse count received immediately prior thereto by more than a predetermined difference count,
means for rejecting said selected plurality of pulse counts and restarting said selected plurality if said predetermined difference count is exceeded, and
means for generating said length parameter representative signal based on an average of said plurality of pulse counts when said predetermined difference count is not exceeded for said selected plurality of pulse counts.

4,413,519

TURBINE BLADE VIBRATION DETECTION APPARATUS

Ronald L. Bannister, Westtown, and John M. Beatty, Aston, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 29, 1981, Ser. No. 287,843
Int. Cl.³ G01H *3/04*
U.S. Cl. 73—660 **11 Claims**



1. Vibration detection apparatus for detecting vibration of turbine blades in a turbine system having a plurality of adjacent turbine blade rows, rotatable about a central axis, comprising:
(a) a plurality of radar sensors mounted on said turbine system;
(b) each said radar sensor being operable to transmit a relatively narrow beam radar signal toward a predetermined blade row and to receive a reflected radar signal therefrom to derive an output radar signal indicative of relative blade movement toward and/or away from said radar sensor;
(c) means coupled to said turbine system to provide an output reference signal for each X degrees of rotation of said blade rows about said central axis relative to a reference position, where $X \leqq 360°$;
(d) means responsive to said output reference signals for providing, for each blade row having one or more said radar sensors, a running count indicative of the number of turbine blades which have traversed said reference position;
(e) first gating means for gating said running counts;
(f) second gating means for gating said radar output signals;
(g) signal processing means operable to provide enabling signals, at predetermined times, to said first and second gating means and being operably connected to receive said signals so gated; and
(h) said signal processing means being further operable to analyze said gated radar output signals to provide an indication signal if said analyzed signal is out of predetermined limits.

4,413,520

ULTRASONIC IMAGING APPARATUS

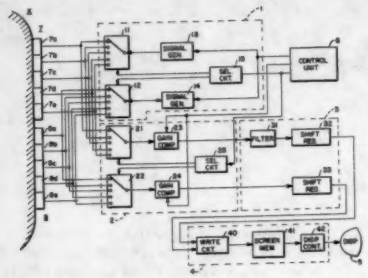
Keiichi Murakami, Kawasaki; Shinichi Amemiya; Junji Miyazaki, both of Yokohama; Tadahiko Yanashima, Fujisawa; Atsuo Iida, Yokohama; Takaki Shimura, Machida; Hirohide Miwa, and Norio Midorikawa, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 16, 1981, Ser. No. 274,160
Claims priority, application Japan, Jun. 16, 1980, 56-21655
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—609 **13 Claims**

13. An ultrasonic imaging apparatus for imaging the internal structure of an object by transmitting ultrasonic waves to the object and receiving acoustic waves from the object, comprising:
first means for generating first and second transducer control signals;
a first transducer unit, operatively connected to said first means, for transmitting ultrasonic waves at a first frequency in dependence upon said first transducer control signal and for receiving acoustic waves, said first trans-

ducer unit having a first frequency characteristic and functioning as a frequency filter on the basis of the first frequency characteristic;

a second transducer unit, operatively connected to said first means, for transmitting ultrasonic waves at a second frequency in dependence upon said second transducer control signal and for receiving acoustic waves, said second transducer unit having a second frequency characteristic different from the first frequency characteristic, said second transducer unit functioning as a frequency filter on the basis of the second frequency characteristic;



second means, operatively connected to said first and second transducer units, for receiving the acoustic waves received by said first and second transducer units and for generating first and second detection signals, respectively;

an electric filter, connected to said second means, for receiving and filtering at least one of said first and second detection signals; and

third means, operatively connected to said second means and said electric filter, for displaying the internal structure of the object.

4,413,521

APPARATUS FOR EXAMINING AN OBJECT BY MEANS OF ULTRASONIC WAVES

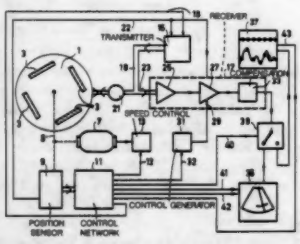
Martinus J. C. Van Kemenade, Santa Ana, Calif., assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 22, 1982, Ser. No. 370,780

Claims priority, application Netherlands, Apr. 29, 1981, 8102104

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—626 **5 Claims**



1. Apparatus for examining an object with ultrasonic waves comprising:

a rotatable shaft;

a cylindrical carrier supported on the shaft for rotation therewith;

a group of n transducers, which function to emit and receive ultrasound energy, regularly distributed around the periphery of the carrier;

drive motor means which function to rotate the shaft;

angle sensing means which function to determine the angular position of the carrier;

a transmitter;

a receiver;

connecting means which function to successively connect the transmitter and receiver to respective transducers;

first display means which function to display an image in the B-mode by displaying an image of a scanned region of the object in the form of a sector of the circle wherein the image consists of a sequence of m picture lines which together span the sector of the circle and the direction of each picture line corresponds to the angular position of the transducer which is connected to receiver during receipt of information which is displayed on that picture line;

second display means which function to display an image in the M-mode by displaying a succession of images formed from a single selected picture line at a plurality of successive instances in time wherein the successive images of the selected picture line are displayed parallel to one another with a constant interline spacing;

switching means which function to selectively connect the receiver to the first display means and/or to the second display means; and

control means which function to actuate the transmitter for the transmission of ultrasound energy each time the carrier reaches one of a plurality of predetermined angular positions and to control the switching means so that it connects the receiver to the second display means at each angular position of the carrier in which a respective one of the transducers is aligned in a direction which corresponds to the selected picture line;

wherein, as an improvement, the control means functions to actuate the transmitter in a cyclic manner so that each of the n transducers supplies data for the formation of a corresponding group of m/n picture lines so that during one revolution of the carrier the entire group of transducers supplies data for m picture lines, to interrupt the cycle for an interrupt period during which a respective operative transducer occupies a positin in which it would otherwise supply data for any one of the n-1 picture lines which immediately follow the selected picture line in the sequence of lines, and to actuate the transmitter at every instant at which any of the transducers occupies a position in which it can supply data for the selected picture line.

4,413,522

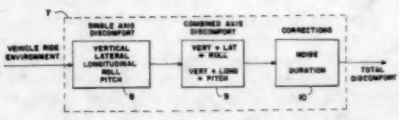
RIDE QUALITY METER

Jack D. Leatherwood; Thomas K. Dempsey, both of Hampton; Sherman A. Clevenson, Newport News, and David G. Stephens, Yorktown, all of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 22, 1981, Ser. No. 267,179

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—646 **8 Claims**



1. A meter for measuring the ride quality of a passenger vehicle comprising:

means on said vehicle for producing an electrical signal proportional to the noise level on said vehicle;

means on said vehicle for producing several electrical signals proportional to vibrations on said vehicle; and

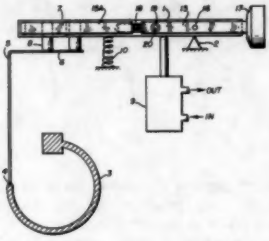
means for combining said electrical signal proportional to noise and said several electrical signals proportional to vibrations to obtain a total discomfort value indicative of the ride quality of said passenger vehicle.

4,413,523

SYSTEM FOR DAMPENING PULSATIONS OR OSCILLATIONS IN A FORCE-BALANCE INSTRUMENT

Kenneth W. Claxton, and Lewis K. Harris, both of Tulsa, Okla., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 23, 1982, Ser. No. 371,084
Int. Cl.³ G01L 7/04
U.S. Cl. 73—701 **7 Claims**



1. A force-balance system responsive to a variable to establish a fluid pressure output signal representative of the variable, including,

a first elongated beam member,

a fulcrum structure for the first beam member,

a structure for exerting a first continuous force on the first beam member in the direction to rotate the beam clockwise about the fulcrum structure,

a pilot valve connected to the first beam member with which to establish a fluid pressure output over a predetermined range,

a primary element responsive to a variable condition by establishing a mechanical movement over a predetermined range,

a variable length spring connected between the first beam member and primary element arranged to exert a force upon the first beam member counter-clockwise about the fulcrum structure,

a compensation beam with its pivot point mounted on the first beam member in an arrangement whereby the compensation beam responds to undesirable oscillations initiated in the first beam member,

and means for connecting the compensation beam to the first beam member so that the response of the compensation beam absorbs the energy of the first beam member to dampen its oscillations.

4,413,524

PULSATION THROTTLING DEVICE FOR A PRESSURE GAUGE

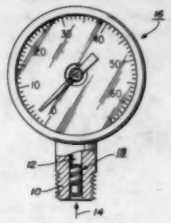
William S. Kosh, Shelton, Conn., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 26, 1982, Ser. No. 362,321
Int. Cl.³ G01L 7/00
U.S. Cl. 73—707 **6 Claims**

1. A pulsation throttling device for a pressure gauge comprising:

(a) an elongated cylindrical plug adapted for a snug fit in a bore communicating with the inlet to the sensing mechanism of a pressure gauge;

(b) said plug including two axially contiguous portions including an upstream portion cooperating with the bore surface thereat to define an annular flow clearance therebetween, and a downstream portion cooperating with the bore surface thereat to define a selective flowpath therebetween effective to dampen pulsation in the flow being conducted in said bore; and



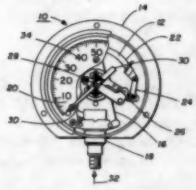
(c) said annular flow clearance of said upstream portion having a radial dimension equal to or less than the minimum clearance afforded by the flow path of said downstream portion.

4,413,525

BOURDON TUBE CONSTRUCTION

Jack Conti, Norwalk, Conn., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 8, 1980, Ser. No. 184,864
Int. Cl.³ G01L 7/04
U.S. Cl. 73—741 **18 Claims**



1. The method of fabricating a Bourdon tube comprising the steps of:

(a) forming a predetermined length of tubing of selected cross section from strip metal longitudinally welded seal tight at an edge gap located on the tubing cross section corresponding to a predetermined near minimal operational stress area for a contemplated in-service Bourdon tube;

(b) shaping said tubing into a desired Bourdon tube configuration for said contemplated in-service while substantially maintaining the location relation of said seal to said stress area; and

(c) sealing one end of said tubing to comprise the displacement end of the Bourdon tube.

4,413,526

DEVICE FOR ACCURATELY MEASURING FLUID PRESSURE WITH DISPLAY OF THE MEASURED PRESSURE

Pierre Delajoud, Neuilly-sur-Seine, France, assignor to Desranges & Huot, Aubervilliers, France

Filed Apr. 27, 1981, Ser. No. 257,610
Claims priority, application France, Apr. 30, 1980, 80 09889
Int. Cl.³ G01L 7/16, 9/10
U.S. Cl. 73—745 **13 Claims**

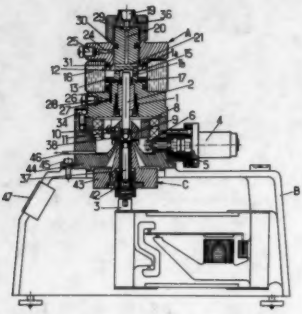
1. A device for the very accurate measurement of a fluid pressure and the display of the measured pressure, comprising in combination:

a very accurate electromagnetic weighing apparatus with a vertical shaft having a top extremity and with display

means for displaying the weight applied to said top extremity of said shaft;

a removable measuring unit including a vertical cylinder and a vertical piston adapted to slide and to rotate in said cylinder with viscuous friction, said piston having a top extremity and a bottom extremity;

means for receiving said measuring unit;



conduit means for applying to said top extremity of said piston the pressure to be measured;

driving means for rotating said piston in said cylinder; and

force transmitting means connecting said bottom extremity of said piston to said top extremity of said shaft and transmitting to said top extremity of said shaft the force to which is submitted said bottom extremity of said piston.

4,413,527

SEMICONDUCTOR PRESSURE SENSOR

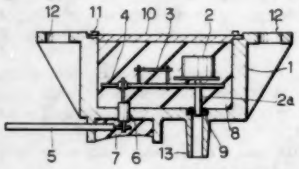
Junzi Sugiura, Toyota; Hiroshi Okada, Hekinan; Michitaka Hayashi; Toru Yamazaki, both of Kariya, and Hiroshi Sugimoto, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 6, 1982, Ser. No. 366,087

Claims priority, application Japan, Apr. 14, 1981, 67-55835

Int. Cl.³ G01L *9/08*

U.S. Cl. 73—754 **5 Claims**



1. A semiconductor sensor unit comprising:

a casing including a pressure introduction pipe and an electrically conductive member;

a pressure sensor unit enclosed by said electrically conductive member in said casing for detecting a pressure introduced through said pressure introduction pipe;

a circuit unit enclosed by said electrically conductive member in said casing for amplifying an output signal delivered from said pressure sensor unit; and,

at least one through-type capacitor mounted on said casing and electrically connected to said electrically conductive member, the arrangement being that a signal from said circuit unit is delivered out of said casing through said through-type capacitor.

4,413,528

MINIATURE PRESSURE TRANSDUCER

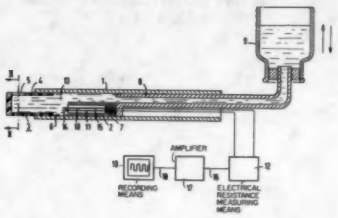
Bertil Hök, Västeras, and Gösta Säll, Norsborg, both of Sweden, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 15, 1981, Ser. No. 254,408

Claims priority, application Fed. Rep. of Germany, May 21, 1980, 3019464

Int. Cl.³ G01L *9/02*

U.S. Cl. 73—753 **5 Claims**



1. A miniature pressure transducer for generating an electrical signal which corresponds to a hydrostatic pressure to be measured in a liquid vessel, comprising an outer tube, a measuring cell disposed in the outer tube, said measuring cell having means for generating an electrical magnitude corresponding to the pressure to be measured, fluid chamber defining means comprising said outer tube defining a chamber in fluid communication with said measuring cell so that the pressure of said chamber is sensed by said measuring cell, a liquid line for the passage of liquid into the chamber, and fluid coupling means for coupling the chamber to liquid whose pressure is to be measured, in a liquid vessel external to said outer tube, wherein the improvement comprises said fluid coupling means being a one-way valve (3) disposed between the chamber (13) and the exterior of said outer tube such that the liquid can only flow in the direction from the chamber (13) into the liquid vessel, said one-way valve (3) consisting of one piece with a sealing and with a spring-back part (4, 5) consisting of a flexible material.

4,413,529

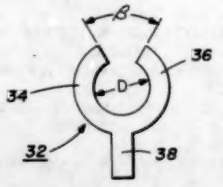
ADJUSTABLY KEYED PRESSURE GAUGE CONSTRUCTION

Robert D. Bissell, Orange, Conn., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sep. 17, 1981, Ser. No. 303,247

Int. Cl.³ G01L *19/00, 7/04*

U.S. Cl. 73—756 **6 Claims**



1. In a pressure gauge including a casing, a Bourdon tube rotationally secured relative to said casing, a pointer operably connected to said Bourdon tube, a dial plate arcuately displaceable for zero calibration setting relative to said pointer and a reference indicia on said dial plate, key means supported on said gauge and adjustably set at a predetermined angular dis-

placement from said reference indicia on the post-calibration setting of said dial plate.

4,413,530

DEVICE FOR MEASURING AND MONITORING GAS FLOWRATES

Laurent J. Guadagnin, and Claude R. Grossiord, both of Annecy, France, assignors to Cricket Sarl, France

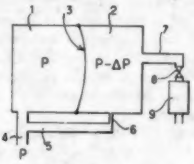
PCT No. PCT/FR80/00094, § 371 Date Feb. 17, 1981, § 102(e) Date Feb. 17, 1981, PCT Pub. No. WO80/02874, PCT Pub. Date Dec. 24, 1980

PCT Filed Jun. 13, 1980, Ser. No. 237,164

Claims priority, application France, Jun. 15, 1979, 79 15438

Int. Cl.³ G01F *1/38*

U.S. Cl. 73—861.47 **4 Claims**



1. Apparatus for measuring the flowrate of a fluid through a system whose through flowrate is to be measured, comprising:

a first chamber in fluid communication and substantial pressure equilibrium with a substantially constant pressure source;

a second chamber in fluid communication with said constant pressure source through a flow restrictor having a through flowrate substantially equal to the through flowrate of the system to be measured;

a valve having an upstream port and a downstream port, said upstream port being in fluid communication with said second chamber and said downstream port being adapted to receive and connect with the system to be measured, said valve being selectively actuable between a first state wherein fluid communication between said second chamber and the system to be measured is blocked and a second state wherein fluid communication between said second chamber and the system to be measured is established;

means for actuating said valve from said first state to said second state upon connection of the sysstem to be measured to said valve and for actuaing said valve from said second state to said first state upon disconnection of the system to be measured from said valve; and

pressure difference measuring means for measuring the pressure difference between said first and second chambers.

4,413,531

DOPPLER FLOWMETER

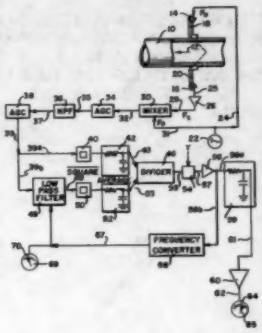
Henry H. B. Karplus, Hinsdale, and Apostolos C. Raptis, Downers Grove, both of Ill., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Nov. 13, 1981, Ser. No. 321,345

Int. Cl.³ G01F *1/66*

U.S. Cl. 73—861.25 **8 Claims**

1. A method of determining the velocity of a slurry flowing in a pipe, comprising the steps of radiating a fixed-frequency ultrasonic signal obliquely into the pipe toward its center and receiving off the flowing slurry a scattered signal that is varied according to the slurry flow and combining the fixed-frequency and scattered signals to give a Doppler shift signal, filtering the Doppler shift signal off the high frequency end and comparing the filtered signal against the Doppler shift signal to obtain a fractional ratio signal, comparing the fractional ratio signal against a preset fractional ratio signal and minimizing the divergence of the fractional ratio signals in a feedback loop, and determining from the feedback loop and the present fraction ratio signal the bandwidth frequencies of the filtered and the Doppler shift signals, which bandwidth



frequencies are proportional to and can be used to determine the velocity of the slurry flow.

4,413,532

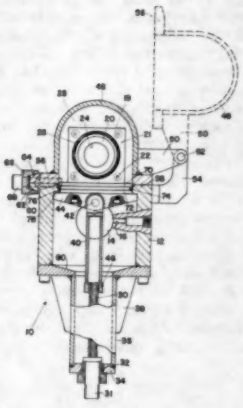
ORIFICE METER WITH ISOLATION VALVE ON THE CARRIER

Davis A. Van Scoy, Simonton, Tex., assignor to Grove Valve and Regulator Company, Oakland, Calif.

Filed Mar. 29, 1982, Ser. No. 362,885

Int. Cl.³ G01F *1/42*

U.S. Cl. 73—861.61 **3 Claims**



1. An orifice meter comprising:

a housing with a lower working chamber and a service chamber;

said lower chamber including:

a pair of planar, parallel walls with aligned flow passages therethrough;

a gate-like carrier for an orifice disc movable between said chambers;

seal rings on opposite sides of said carrier operative to seal around said flow passages when said carrier is in said working chamber;

a restricted passageway between said chambers;

a valve closure member of a size and shape to fit snugly in said passageway carried on the lower end of said carrier; and

a resilient seal around said closure member.

4,413,533

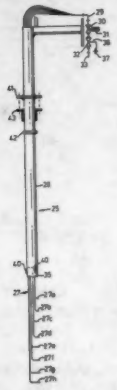
SAMPLING DEVICE FOR ISOKINETIC SAMPLING

Hans A. Diesel, Annandale, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Oct. 29, 1981, Ser. No. 316,294

Int. Cl.³ G01N *1/20*

U.S. Cl. 73—863.31 **15 Claims**



1. A sampling device for isokinetic sampling of a flowable substance passing through a conduit comprising a plurality of tubes fixedly located relative to each other, each tube including an inlet end having an inlet opening, a discharge end having a discharge opening, an adjustable metering valve means for regulating the flow rate through each tube and an operating valve for permitting and preventing flow through each tube, the volume contained in each tube between the inlet opening and the valve being substantially equal to the corresponding volume of each of the other tubes, the inlet openings of the tubes being spaced apart substantially in a common plane and facing in the same direction, and the sampling device being so constructed and arranged for a part thereof including said inlet openings to be received in leak-proof fashion through an orifice in the wall of the conduit, operating plate means connected to each said operating valve for opening and closing all said operating valves simultaneously when each said separate metering valve means has been set to substantially equalize the flow rate through each tube, and a plurality of individual containers located adjacent each said tube discharge end to receive a plurality of individual samples therein upon opening of each said operating valve means.

4,413,534

SAMPLE TRANSPORT MECHANISM

Toma Tomoff, Uberlingen; Hans G. Mohr, Uhldingen, and Volker Kempf, Uberlingen, all of Fed. Rep. of Germany, assignors to Bodenseewerk Perkin-Elmer & Co., GmbH, Uberlingen, Fed. Rep. of Germany

Filed Jul. 9, 1981, Ser. No. 281,809

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1980, 3030396

Int. Cl.³ G01F *35/06*

U.S. Cl. 73—864.21 **11 Claims**

1. Mechanism for automatically supplying sample from sample vessels to a measuring loop of a liquid chromatograph; said mechanism comprising:

a stationary holder arranged to retain said sample vessels in rows parallel, whereby each sample vessel can be characterized by a row and a column number;

a dosing tube, said tube having a front end and a rear end; said dosing tube being vertically movable by a third servomotor;

a changing-over valve having a plurality of ports;

a measuring loop, said measuring loop being connected to a first port and a second port of said changing-over valve;

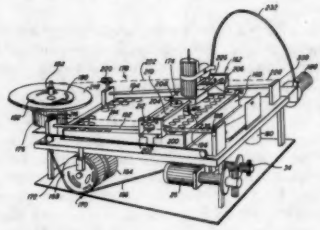
a solvent pump outlet, said solvent pump outlet connecting to a third port of said changing-over valve,

means for positioning said dosing tube between a first position whereat said front end thereof is in one of said sample vessels and said rear end thereof communicates with a dosing pump whereby sample fluid can be sucked into said dosing tube, and a second position whereat said front end thereof communicates with said first port of said changing-over valve and whereat said dosing pump discharges said sample from said dosing tube into said measuring loop;

a control unit for controlling and synchronizing said changing-over valve with said dosing tube position whereby when said dosing tube is in said first position thereof said solvent pump communicates with said column and when said dosing tube is in said second position thereof said solvent pump communicates with said column via said measuring loop;

a cradle extending parallel to said rows is movably guided above said holder in a direction perpendicular to said rows by a first servomotor via a rope transmission, wherein the position of said first servomotor being controlled by a first coding device;

a carriage movably guided on said cradle along said rows,



said carriage being adjustable by a second servomotor via a rope transmission, said second servomotor being controlled by a second coding device,

said cradle and said carriage being movable into a position beside said holder, whereat said dosing tube is located above the sample discharge station;

said second servomotor being stationary with respect to the apparatus on one side of the holder,

said cradle being guided on two parallel sliding bars; and

said rope transmission assigned to the second servomotor comprises a rope, which:

is retained stationary with respect to the apparatus with one end on the side remote from the servomotor and extends along one sliding bar;

is deviated around a first deviating roller provided on one side of said cradle and being guided along the guide means of said carriage to a second deviating roller provided thereon;

is deviated through 180° by said second deviating roller and guided to a third deviating roller provided on said cradle and being coaxial to said first deviating roller:

is deviated thereby and guided further along one sliding bar;

winds around a pulley located on said second servomotor;

then extends along the other sliding bar;

is deviated around a fourth deviating roller provided on the other side of said cradle and guided along said guide means of said carriage to a fifth deviating roller provided thereon;

is deviated through 180° by said fifth deviating roller end

guided to a sixth deviating roller provided on said cradle and coaxial to said fifth deviating roller,

is deviated thereby and guided further along the other sliding bar and also being stationary with respect to the apparatus with the other end on the side remote from the servomotor.

4,413,535

POWER TRANSMISSION APPARATUS

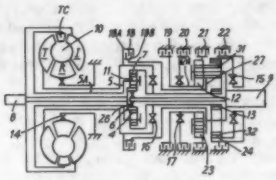
Howard F. Hobbs, Rugby, England, assignor to Variable Kinetic Drives Limited, Northamptonshire, England

Filed Jun. 17, 1980, Ser. No. 160,169

Claims priority, application United Kingdom, Jun. 26, 1979, 7922130

Int. Cl.³ F16H *47/08*

U.S. Cl. 74—688 **7 Claims**



1. A power transmission apparatus comprising a torque converter having an input shaft **(8)**, an impeller connected to the input shaft, an output turbine, a first uni-directional detent **(14)**, a reactor connected to a fixed part on which to react by means of said first uni-directional detent which is arranged to prevent rotation of the reactor in a reverse direction, and a circulatory turbine, a first gearing **(11)** connecting the circulatory turbine to the input shaft **(8)**, a second gearing **(12, 13, 27, 31, 32)** connecting the first gearing to an output shaft **(9)**, a second uni-directional detent **(17)** and a brake **(20)** arranged to act between part of the second gearing and a stationary part, the apparatus having a ring gear **(23)** and a holding device **(21, or 21A)** acting on said ring gear **(23)**, both being included in the second gearing, whereby when the ring gear is held stationary by said holding device, the output shaft is driven in reverse.

4,413,536

AUTOMATIC TRANSAXLE CONTROL SYSTEM

Douglas A. Whitney, Livonia, and Sergio Kavalhuna, Plymouth, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 11, 1980, Ser. No. 176,948

Int. Cl.³ B60K *41/10*

U.S. Cl. 74—869 **7 Claims**

1. A control system for an automatic transmission for delivering torque from a driving member to a driven member comprising:

planetary gear elements connecting said driving and driven members;

fluid pressure operated clutch means for connecting two gear elements together to establish a high speed ratio;

fluid pressure operated brake means for anchoring one of said gear elements to establish an underdrive speed ratio, said brake means comprising a fluid pressure piston in a cylinder with a brake apply pressure chamber on one side of said piston and a brake release pressure chamber on the other side of said piston;

a pressure source;

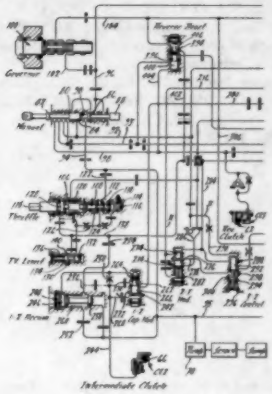
conduit structure connecting said pressure source and said clutch means and connecting said pressure source and said pressure chambers;

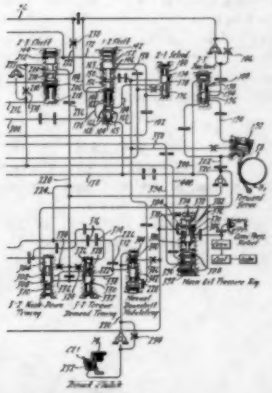
shift valve means in said conduit structure for controlling pressure distribution to said clutch and brake means whereby ratio changes may be accomplished between said high speed ratio and said underdrive ratio;

governor valve means for developing a pressure signal proportional to driven speed of said driven member, throttle valve means for developing a pressure signal proportional to the torque on said driving member;

said governor valve means and said throttle valve means being connected to said shift valve means for imposing thereon opposed activating forces;

said transmission assuming a high speed ratio condition when said clutch means and said release pressure chamber are pressurized simultaneously and assuming an underdrive condition when said clutch means and said pressure release chamber are exhausted;





separate exhaust pressure flow paths for said clutch means and said release pressure chamber including a common flow path portion, said shift valve means being disposed in and forming a part of said common flow path portion;

a downshift kick-down timing valve means and a downshift torque demand timing valve means in the exhaust flow path for said pressure release chamber, each timing valve means being responsive to said speed pressure signal;

the exhaust flow path extending from said release pressure chamber having parallel branches, said downshift kick-down timing valve means being on the exhaust flow upstream side of said downshift torque demand timing valve means;

a plurality of orifices in said exhaust flow paths, a first of said orifices being in the exhaust flow path for both the said clutch means and said release pressure chamber and a second of said orifices being in the flow path for said pressure release chamber only;

said timing valve means each responding to said speed pressure signal to provide a flow path through a first set of said orifices at speeds of said driven member less than a predetermined valve and through a second set of said orifices at speeds of said driven member greater than said predetermined value.

4,413,537

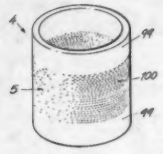
METHOD OF MAKING A TUBULAR CYLINDER FOR EXTRUDING A PRODUCT

Robert R. Fischer, Michigan City, and Joe R. Urschel, Valparaiso, both of Ind., assignors to Urschel Laboratories, Incorporated, Valparaiso, Ind.

Division of Ser. No. 286,373, Jul. 24, 1981. This application Sep. 21, 1982, Ser. No. 420,738

Int. Cl.³ B21K *21/00*

U.S. Cl. 76—101 R **13 Claims**



1. A method of constructing a cylinder comprising providing a support, asssembling an appreciable number of notched circular layers of metal about said support, compressing said layers, brazing said layers and support while the layers are compressed to provide a unitary tubular cylinder, and cutting away a cylindrical portion of said cylinder whereby said notches provide a multitude of circumferentially and longitudinally spaced substantially radially extending passages extending through the wall of the cylinder.

4,413,538

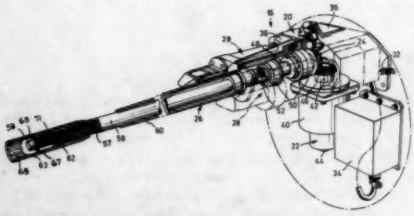
UNIVERSAL SERVICE TOOL

Robert D. Norman, Bramalea, Canada, assignor to Spar Aerospace Limited, Toronto, Canada

Filed Mar. 17, 1981, Ser. No. 244,670

Int. Cl.³ B25B *17/00*

U.S. Cl. 81—57.13 **12 Claims**



1. A tool comprising:

(a) a housing;

(b) power transmission means mounted on said housing for connection with a power source;

(c) a powered shaft supported by said housing to extend therefrom along a first axis, said shaft being operably connected to said power transmission means to be driven through it in use;

(d) workpiece engaging means mounted on said housing laterally outwardly from said shaft, said workpiece engaging means being secured to said housing to prevent rotation about said powered shaft and adapted to engage a workpiece in use such that the workpiece may be restrained against longitudinal and rotational movement with respect to said housing when worked by operation of the powered shaft;

(e) said workpiece engaging means comprising a pair of latch assemblies projecting from said housing, one on either side of said powered shaft to engage a workpiece at opposite sides of said powered shaft;

(f) each of said latch assemblies comprising:

(i) latch support means on said housing,

(ii) a latching shoulder projecting laterally at first end of said support means,

(iii) a latch actuator rod having a first end and a second end, said latch actuator rod being slightably mounted in said support means to reciprocate longitudinally between an extended position and the retracted position, said first end of said actuator rod projecting forwardly from said first end of said support means,

(iv) a latching head mounted at said first end of said actuator rod, said latching head having an inner end disposed toward said shoulder,

(v) a pair of latch arms each having an upper arm portion and a forearm portion, the proximal end of each upper arm portion being pivotally connected to the inner end of the head, one at each side thereof, the distal end of each upper arm portion being pivotally connected to the proximal end of the forearm portion, the distal end of each forearm portion being pivotally mounted on the housing adjacent the latch actuator rod, said arms articulating in response to movement of said head such that when said head is in said extended position, the arms are extended and arranged inline with the head and when the head is in the retracted position, the arms are bent such that the forearm portions project laterally to overlie said shoulders to clamp a workpiece therebetween,

(vi) latch drive means operable to drive said actuator rod relative to said support means between said extended position and said retracted position to move said head to effect movement of said link arms as aforesaid.

4,413,539

NUMERICALLY CONTROLLED LATHE

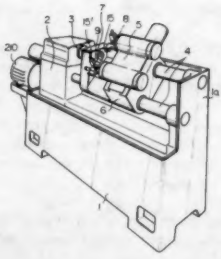
Shinichi Ishizuka, and Kenji Sugimoto, both of Tanashi, Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Oct. 29, 1980, Ser. No. 201,847

Claims priority, application Japan, Oct. 31, 1979, 54-140821; Oct. 31, 1979, 54-140822; Feb. 26, 1980, 55-22982; Feb. 26, 1980, 55-22983; Feb. 26, 1980, 55-22984; Mar. 21, 1980, 55-35962; Mar. 21, 1980, 55-35963; Mar. 22, 1980, 55-36444

Int. Cl.³ B23B *3/18, 29/32*

U.S. Cl. 82—2 R **7 Claims**



1. A numerically controlled lathe, comprising:

a stationary headstock;
a spindle supported in said headstock for rotational movement;
first guideway means located in front of said headstock, extending horizontally and parallel to the axis of said spindle;
a saddle horizontally movable on said first guideway means relative to said spindle, said saddle including second guideway means extending perpendicular to said first guideway means;
a cross slide slidably supported by said second guideway means and movable in a direction perpendicular to said first guideway means;
first and second tool posts supported by said cross slide and located in opposing relationship with respect to the axis of said spindle, said first and second tool posts including turret heads, respectively, each carrying a plurality of tool receivers;
turret indexing means allowing indexing of one of said turret heads while a tool of the tool receiver of the other one of turret heads is in a cutting position relative to the axis of said spindle;
a guide bush;
a guide bush supporting member located between said spindle and said first and second tool posts and connected to said saddle for horizontal movement therewith, said supporting member supporting said guide bush in concentric relation with the axis of said spindle; and
detecting means for detecting when a tool of the tool receiver of the other one of said turret heads is in said cutting position relative to the axis of said spindle;
said turret head of said first tool post and said tool receiver of said second tool post including axes extending parallel to the axis of said spindle and being located between said guide bush supporting member and adjacent ends of said first and second tool posts in an area away from said second guideway means;
each of said turret heads having a plurality of tool mounting faces circumferentially spaced apart about the axis of said turret head, with the number of the tool mounting faces being of n number of an odd number; and
said turret indexing means comprising cylinder means, piston means movable in said cylinder means to (n+1)/2-number of stopping positions to effect indexing of each of said turret heads at a plurality of indexing positions, stopper means mounted to said cylinder means to cause said piston means to stop at said stopping positions, and adjusting means cooperating with said stopper means to effect adjustment of said stopper positions relative to said indexing positions, gear means provided between each of said turret heads and said cylinder means to permit the engagement therebetween, and means for shifting said gear means into and out of engagement.

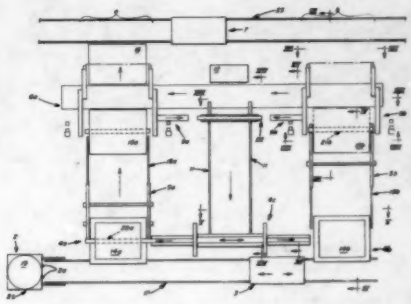
4,413,540

FOAM PEELING PROCESS AND APPARATUS

Russell W. Burge, Covina, Calif., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Dec. 18, 1981, Ser. No. 332,284
Int. Cl.³ B23Q *37/00*
U.S. Cl. 82—47 **14 Claims**

1. A process for producing a continuous sheet of foam material in roll form comprising:
(A) transporting a cylindrical foam body to a first station,
(B) at said first station, inserting a supporting rod through the longitudinal axis thereof,
(C) transporting a cylindrical foam body from said first station to a second station,
(D) at said second station,
(i) rotating a cylindrical foam body about its longitudinal axis by rotating a supporting rod located therein,
(ii) bringing a downwardly moving cutting element from a first position into contact with the rotating foam body to thereby produce a continuous sheet of foam material,
(iii) winding said continuous sheet upon a mandrel,
(iv) stopping the downward moving of said cutting element once the cutting element has progressed a predetermined distance through said rotating foam body,
(v) discharging the fully wound roll from said second station,
(vi) discharging the remainder of said foam body from said second station, and
(vii) returning said cutting element to said first position,
(E) transporting said remainder of said foam body to a third station,



(F) at said third station, removing said remainder from its supporting rod, and
(G) transporting said supporting rod from said third station to said first station, wherein
(i) the transporting step (A) does not occur until completion of the operation of step (B) and occurs substantially simultaneously with the transporting step (C),
(ii) the transporting step (C) does not occur until completion of the operation of step (D), and
(iii) the transporting step (E) does not occur until completion of the operation of step (D) (i) through (vi).

4,413,541

RAPID CHANGEOVER PRINTER

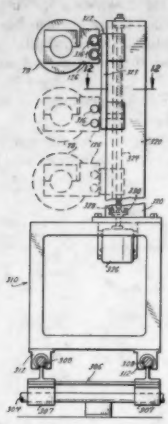
Frank M. Biggar, III, Lakeview, N.Y., assignor to Elizabeth Short Biggar, Silver Creek, N.Y.

Continuation of Ser. No. 123,171, Mar. 10, 1980, abandoned, which is a continuation-in-part of Ser. No. 20,799, Mar. 15, 1979, abandoned. This application May 18, 1982, Ser. No. 379,484
Int. Cl.³ B26D *7/26*
U.S. Cl. 83—346 **14 Claims**

1. In a station of a compound printer for processing a continuous web, the station having a frame and at least one cylinder mounted within said frame; means for rapid changeover of said cylinder, said rapid changeover means comprising:
bearing means mounting said cylinder within said frame for sliding transverse movement of said bearing means and cylinder in a direction parallel to the cylinder axis along a first track means,
a cart having a main frame,
bearing means supporting a replacement cylinder within said cart main frame for sliding transverse movement of said replacement cylinder in a direction parallel to the replacement cylinder axis along a second track means,
said cart having a third track means for slidingly receiving said station cylinder,
means for positioning said cart adjacent said station with said second track means parallel to said first track means and with said first and third track means in transverse alignment for the transverse sliding movement of said cylinder

and its bearings from said first track means of said station and onto said third track means of said cart, and

means for positioning said second track means in transverse



alignment with said first track means for transverse sliding movement of said replacement cylinder and its bearings from said second track means of said cart onto said first track means of said station.

4,413,542

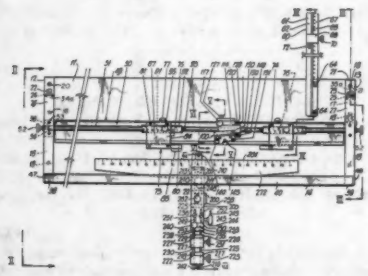
MAT CUTTER AND GUIDE SYSTEM

Delmar Rempel, 1421 Egbert Ave., Saskatoon, Saskatchewan, Canada (S7N 2L8)

Filed Apr. 30, 1980, Ser. No. 145,340

Int. Cl.³ B26D *7/02, 7/26, 5/10*

U.S. Cl. 83—455 **28 Claims**



1. A mat cutter for picture frame mats comprising:

(a) a rectangular cutter base having a planar mat-supporting surface;

(b) a clamping frame including a pair of spaced-apart, parallel, transverse, lateral hinge bars, each being secured by an associated hinge means adjacent its respective rear end, a longitudinally extending handle interconnecting the respective forward ends of the transverse, lateral hinge bars, and a longitudinally extending intermediately transversely positioned cutter head guide bar assembly disposed between said hinge bars, said cutter head guide bar assembly including a guide plate having a lower surface which, in use, lies flush with said picture frame mat resting on said mat-supporting surface and a guide rod secured to its upper surface, said guide rod being journalled for selective restrictive rotation in, and with respect to, said transverse, lateral hinge bars, at a point intermediate the forward end and the rearward end of said transverse, lateral hinge bars, each said hinge means having a first stop member cooperating with an associated said hinge bar to limit rotation of said cutter head guide bar assembly and said clamping frame to an upright position at a selected angle within the range of from about 92°–96° to the plane of said cutter base, and each said hinge means having a second stop member cooperating with an associated said hinge bar to limit rotation of said cutter head guide bar assembly and said clamping frame to a lowered position at which the bottom surface of said guide plate is flush with, but is not resting with any significant weight upon, said picture frame mat which is resting on said mat-supporting surface, said clamping frame being selectively deformable by exerting downward pressure on said cutter head guide assembly, thereby to urge said guide plate into gripping engagement with said picture frame mat;

(c) a cutter head slidably mounted along said guide rod by means of a replaceable bearing block, said cutter head including spaced-apart longitudinal edges, one of said edges forming an acute angle to the plane of said base and the other forming approximately a right angle to the plane of said base, said cutter head including a pair of cutting blades pivotally carried thereby, one blade being disposed for guidance by, and cooperation with, each longitudinal edge of said cutter head; and

(d) a pair of longitudinally spaced-apart, longitudinally slidably, adjustably, movable, fixable, but detachable stop means, each being mounted on said guide rod to limit to-and-fro slidable movement of said cutter head along said guide rod.

4,413,543

SYNCHRO START DEVICE FOR ELECTRONIC MUSICAL INSTRUMENTS

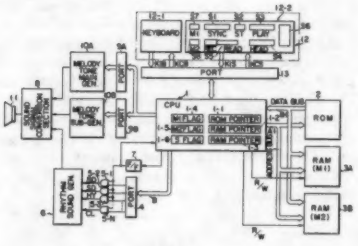
Akio Iba, Tokorozawa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Dec. 18, 1981, Ser. No. 331,972

Claims priority, application Japan, Dec. 25, 1980, 55-185268

Int. Cl.³ G10H *1/42, 7/00*

U.S. Cl. 84—1.03 **13 Claims**



1. A synchro start device for an electronic musical instrument comprising:

memory means including a plurality of memory areas, each memory area being capable of storing musical tone codes representing musical tones sequentially, each memory area having a plurality of memory locations;

setting means for setting a specific memory area of the plurality of memory areas as a main memory area;

inputting means for inputting a synchro start code at a specified location in said main memory area;

first means for reading out musical tone codes and a synchro start code from said main memory area;

second means for starting to read out musical tone codes sequentially from a memory area other than said main memory area when said synchro start code is read out from said main memory area by said first means; and

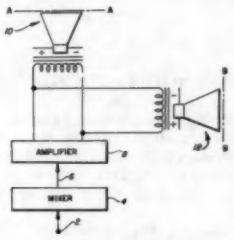
automatic playing means for performing an automatic play of the electronic musical instrument in accordance with said musical tone codes read out by said first and second means.

4,413,544

SINGLE CHANNEL STRING ENSEMBLE SOUND SYSTEM FOR AN ELECTRONIC MUSICAL INSTRUMENT

Donald R. Sauvey, Palatine, Ill., assignor to The Marmon Group, Inc., Chicago, Ill.

Filed Jan. 18, 1982, Ser. No. 340,579
Int. Cl.³ G10H *1/02*
U.S. Cl. 84—1.24 **3 Claims**



1. A single channel sound system for use in an electronic organ having a keyboard and a signal means responsive to the depression of keys on said keyboard for generating electric signals representing the waveforms produced by a string instrument, said single channel sound system being responsive to said electric signals for generating string ensemble tones for a listening audience and comprising:

a mixer circuit for receiving said electric signals representing the waveforms produced by string instruments and dividing said signals into at least two separate signals, phase shifting at least one of said separate signals with respect to the other separate signal and combining said separate phase shifted signal and said other separate signal into a phase shifted output signal;

an amplifier connected in circuit to said mixer circuit for receiving said phase shifted output signal and providing an amplified phase shifted output signal;

a first transducer driven by said amplified phase shifted output signal and physically oriented in a plane to directly radiate sound waves toward the listening audience;

a second transducer driven by said amplified phase shifted output signal substantially 180° out of phase electronically from said first transducer and physically oriented in a plane to radiate sound waves by reflection toward the listening audience;

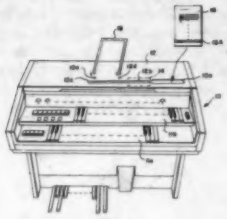
said plane of said second transducer is substantially perpendicular to said plane of said first transducer for providing sound waveforms from said first transducer and said second transducer which, in addition to being 180° out of phase, acoustically cancel and reinforce each other providing both direct and reflected sound waveforms to the listening audience which simulate the actual waveforms produced by a string ensemble.

4,413,545

MUSIC DATA READING TYPE ELECTRONIC MUSICAL INSTRUMENT

Eisaku Okamoto, and Kohtaro Mizuno, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka, Japan

Filed Jul. 28, 1981, Ser. No. 287,560
Claims priority, application Japan, Jul. 30, 1980, 55-108084[U]
Int. Cl.³ G10H *3/03*
U.S. Cl. 84—1.28 **6 Claims**



1. An electronic musical instrument comprising:

(a) a keyboard;

(b) a musical instrument body incorporating said keyboard, said musical instrument body having in an upper surface thereof behind said keyboard a first groove portion for supporting a music sheet during play of music on said music sheet and for holding said music sheet in a position to show a musical representation of musical notes on said music sheet to a player, a second groove portion and a third groove portion and all of which are upwardly opened to accept a lower portion of said music sheet and are arranged continuous to form a music sheet passage extending substantially parallel to a longitudinal direction of said keyboard, said music sheet having at said lower portion a data recording portion carrying music data corresponding to said musical notes;

(c) a reading device disposed at said second groove portion for reading said music data from the data recording portion as the sheet is moved through said music sheet passage from the third groove portion through the second groove portion to the first groove portion; and

(d) memory means for storing the music data read out by the reading device.

4,413,546

DRUM MAGAZINE FOR CARBINES OR THE LIKE

William J. Taylor, Jr., 828 Sycamore Dr., Decatur, Ga. 30030

Filed Dec. 17, 1980, Ser. No. 217,236
Int. Cl.³ F41C *25/10*
U.S. Cl. 89—33 D **5 Claims**

1. Drum magazine apparatus for successively feeding a plurality of cartridges to a firearm, comprising:

means defining a housing;

means within said housing to define a channel for receiving a plurality of cartridges in serial relation relative to a feeding end of said channel;

extension means associated with said housing and defining a cartridge feeding channel in communication with said feeding end of said cartridge receiving channel;

means within said housing operative to urge said plural cartridges in a forward direction along said cartridge receiving channel toward said cartridge feeding channel;

loading means selectably operative from outside said housing to move said cartridge urging means in a backward direction sufficiently to admit one cartridge at said feeding end, so as to permit loading a cartridge into the open end of said cartridge receiving channel through said cartridge feeding channel;

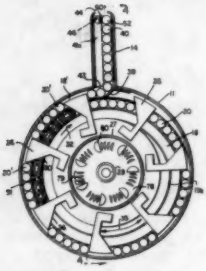
said cartridge receiving path being an arcuate path within said housing;

said cartridge urging means comprising a rotor having a plurality of arms extending outwardly from the rotor in angularly spaced apart relation and disposed across said cartridge receiving channel, so that said arms define a number of cartridge receiving spaces along the cartridge receiving channel;

each said cartridge receiving space being sufficient to accommodate several individual cartridges in side-by-side relation, and each cartridge space being separated from an adjacent cartridge space by an arm;

means operative to urge said rotor in said forward direction along the cartridge receiving channel, so that said cartridge spaces and the individual cartridges received therein are moved along the cartridge receiving channel toward said feeding end as cartridges are fed from said extension means;

a plurality of detents associated with said rotor;



an operating means operable from outside said housing to engage a detent and move said rotor back sufficiently to receive a cartridge;

said detents comprising plural groups of first detents, each such detent group corresponding to one of said cartridge receiving spaces defined between two adjacent rotor arms;

each said group of first detents having a plurality of first detents corresponding in number to the number, minus one, of cartridges accommodated by the corresponding cartridge receiving space and being operative to move said rotor back a first distance when engaged by said operating means;

each group of first detents being separated from an adjacent group of detents by a second detent, each of said second detents corresponding to one of said rotor arms; and

said second detents operative to move said rotor back a second distance greater than said first distance whenever one of said rotor arms is aligned with said feeding end of said cartridge receiving channel.

4,413,547

SERVO-CONTROL DEVICE FOR AIRCRAFT FLIGHT CONTROL

Gerard L. Devaud, Paris, France, assignor to Societe d'Applications des Machines Motrices, Issy-les-Moulineaux, France

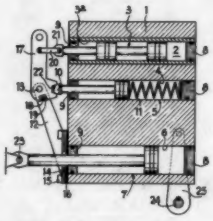
Filed Jan. 21, 1981, Ser. No. 227,118

Claims priority, application France, Jan. 25, 1980, 80 01591

Int. Cl.³ F01B *15/00*; F15B *9/10*

U.S. Cl. 91—216 R **4 Claims**

1. A flight control apparatus for an aircraft comprising: a directional valve having a body and a spool mounted in a longitudinal passageway in the body for axial, bidirectional movement relative to a neutral position of the spool, fixedly mounted guide means cooperative with the body for guiding the body which is movable relative to said guide means, a support mounted on the valve body and stationary with respect thereto, a pivot pin carried by the support, said pivot pin being stationary with respect to the valve body, a control lever pivotally mounted on the pin for limited angular displacement about an axis defined thereby, said axis being stationary with respect to the valve body, means connecting the spool to the



lever, and a shim forming a spacer member interposed between the support and the valve body for adjustably fixing the stationary position of the support with respect to the body to thereby enable the facile adjustment of the neutral position of the spool.

4,413,548

HYDRAULIC MOTOR WITH ADJUSTABLE FLOW VOLUME

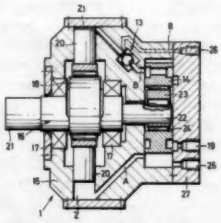
Jurgen Klie; Walter Lubos, both of Sprockhoevel, and Wilhelm Flieter, Hattingen, all of Fed. Rep. of Germany, assignors to G. Düsterloh GmbH, Sprockhoevel, Fed. Rep. of Germany

Filed Mar. 15, 1982, Ser. No. 357,877

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1981, 3109706

Int. Cl.³ F01B *1/06*; F04B *21/02*

U.S. Cl. 91—491 **9 Claims**



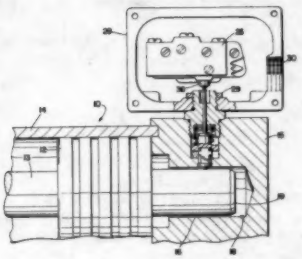
1. An adjustable, axial or radial piston type hydraulic motor having at least two cylinders and pistons cooperating with a rotary crankshaft or with a reaction guiding member, a fluid flow distributor, intake and return pressure conduits provided between the distributor and the cylinders, comprising at least one pressure-actuated control valve arranged in one of said pressure conduits, said control valve being a check valve spring-biased into its closing position by a relatively weak biasing means, said check valve being formed with a first surface portion exposed in its opening direction to pressure fluid from said cylinder, a second surface portion exposable to pressure fluid either in opening direction or in closing direction depending on the relative position of said distributor to the pressure conduit for the check valve, and a third surface portion exposable to working fluid in opening direction; said second surface portion being at least as large as said first surface portion and larger than said third surface portion, and the combined areas of said first and third surface portions being larger than the area of said second surface portion.

4,413,549

LIMIT SWITCH ACTUATOR FOR FLUID CYLINDERS

Raymond J. Knable, Elmhurst, Ill., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Jun. 18, 1981, Ser. No. 274,940
Int. Cl.³ F01B 31/12
U.S. Cl. 92—5 R 4 Claims



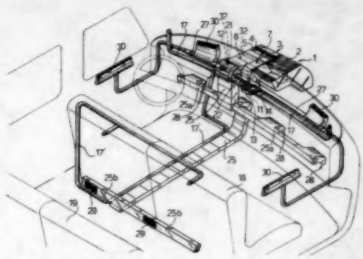
1. In combination with a fluid cylinder, a switch assembly for detecting the position of the piston or other movable element of the fluid cylinder, comprising a housing at one end of said cylinder in which said movable element reciprocates under control of fluid pressure, said housing having a bore therein transversely oriented with respect to the path of movement of said movable element and a counterbore, an actuator body member sealingly engaged in said counterbore forming a chamber with said housing in fluid communication with the interior of said fluid cylinder, said body member having a central bore therein transverse to the path of movement of said movable element, switch means mounted on said body member, an actuator rod slidably received in said central bore of said body member for actuating said switch means, said actuator rod being engageable at the outer end thereof with said switch means, means sealing said actuator rod, an actuator shoe fixed to the inner end of said actuator rod for movement therewith, said shoe having a central stop bore therein, means biasing said actuator shoe away from said body member, and a plunger received in said stop bore and guided in said housing bore, said plunger extending from said chamber through said housing bore and into the path of movement of said movable element, said plunger having a conical tip thereon for engagement with said movable element to move said plunger in said housing bore and to move said actuator shoe and rod for actuation of said switch means, said plunger having a shoulder thereon larger than the diameter of said housing bore for retaining said plunger within said chamber, said plunger having means at its periphery between said conical tip and said shoulder forming a fluid path between the interior of said fluid cylinder and said chamber for preventing fluid pressure unbalance on said plunger and for guiding said plunger for linear movement in said housing bore, said plunger means comprising alternate first and second surfaces distributed about the periphery of said plunger, said first surfaces on said plunger being spaced from said housing bore to form fluid paths, and said second surfaces intersecting said first surfaces closely adjacent said housing bore to form guides for limiting movement of said plunger linearly of said housing bore.

4,413,550

VENTILATION SYSTEM FOR THE PASSENGER COMPARTMENT OF A MOTOR VEHICLE

Renzo Piano, Paris, France, assignor to Fiat Auto S.p.A., Turin, Italy

Filed May 13, 1981, Ser. No. 263,066
Claims priority, application Italy, May 20, 1980, 67793 A/80
Int. Cl.³ B60H 1/24
U.S. Cl. 98—2 8 Claims



1. A ventilation system for the passenger compartment of a motor vehicle comprising:

a first conduit system in the vehicle for supplying a first series of substantially pulsating air flows into the high portion of the passenger compartment inner space where the heads of the passengers are normally situated, and means in the first conduit system which cyclically interrupts the pulsating air flows for a predetermined period of time; and

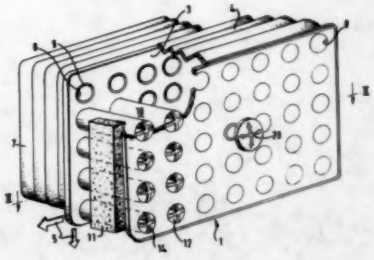
a second conduit system in the vehicle for supplying a second series of substantially continuous air flows into the low region of the passenger compartment inner space.

4,413,551

VENTILATOR GRILL

Alan S. Jackson, Benfleet, England, assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 2, 1981, Ser. No. 317,352
Int. Cl.³ F24F 13/08
U.S. Cl. 98—40 V 13 Claims

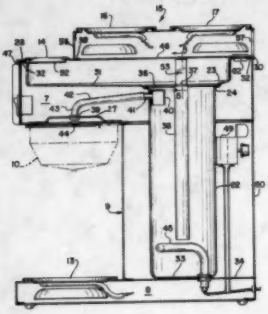


1. A ventilator grill comprising a front plate defining an array of apertures characterized by a back plate disposed in a parallel relationship with the front plate, and also defining an array of apertures, a plurality of adjacent aligned tubes, each end of which registers with a respective aperture in each of the plates to conduct air therebetween, and means for moving one of the plates relative to the other while retaining their parallel disposition, the ends of each tube being pivotable relative to the aperture with which it registers in free sliding engagement with the peripheral surface thereof.

4,413,552
COFFEE MAKING MACHINE

Donald L. Daugherty, Sherman, Ill., assignor to Bunn-O-Matic Corporation, Springfield, Ill.

Filed Dec. 28, 1981, Ser. No. 334,579
Int. Cl.³ A47J 31/00
U.S. Cl. 99—295 6 Claims

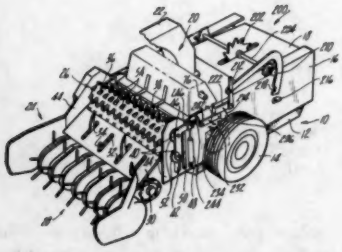


1. In a cold water, pour-in beverage brewer, comprising: a generally C-shaped body providing upper and lower leg portions interconnected by an upright leg portion; means for supporting a removable brewer funnel underneath the upper leg portion; heater means on the lower leg portion for heating and supporting a beaker under said brewer funnel; a shallow cold water basin housed within said upper leg portion; and a deep hot water tank housed mainly within said upright leg portion; the improvement wherein said cold water basin and said hot water tank are integral and constitute an inverted L-shaped receptacle, the bottom of said cold water basin having an opening that mates with the opening at the top of said hot water tank, a plate closing off said mating openings, said plate having a drain opening therein, and a cold water tube depending from the underside of said plate with the upper end thereof in communication with said drain opening.

4,413,553
BALER

Alexander Crawford, Mississauga, Canada, assignor to Massey-Ferguson Industries Limited, Toronto, Canada

Filed Aug. 24, 1981, Ser. No. 295,881
Int. Cl.³ B65B 13/24
U.S. Cl. 100—4 5 Claims

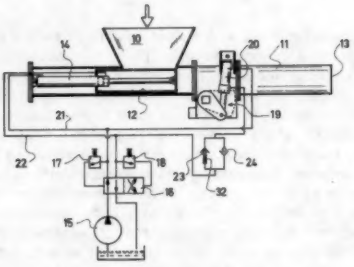


1. A baler comprising:
a bale chamber having an inlet end;
feeding means including a pair of feed rollers capable of feeding crop material into the bale chamber;
reciprocating means including a hydraulic cylinder capable of reciprocating the pair of feed rollers between first and second positions across the inlet end of the bale chamber;
bale tying means carried by the bale chamber, the bale tying means including a knotter, a pickup needle capable of bringing twine to the knotter, and a knotter shaft interconnected with the knotter and needle;
actuating means capable of actuating the bale tying means including a bale length metering mechanism, a sprocket constantly driven by a hydraulic motor, and a single revolution clutch interconnecting the sprocket with the knotter shaft, the bale length metering mechanism being interconnected with said single revolution clutch and capable of initiating operation of the clutch to cause rotation of the knotter shaft when the proper bale length has been achieved; and
coordinating means capable of preventing operation of the clutch except when the pair of rollers have been reciprocated to said first position.

4,413,554
REFUSE COMPACTING DEVICE

Carl-Otto Wallander, Västra Frölunda, Sweden, assignor to Hydropress Wallander & Co. AB, Mölndal, Sweden

Filed Apr. 29, 1982, Ser. No. 373,058
Int. Cl.³ B30B 15/16
U.S. Cl. 100—43 3 Claims

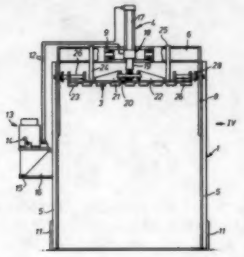


1. A device for compacting refuse material and of the type comprising a piston reciprocable within a tube and being driven by a first double-acting hydraulic ram having a first end connected to a source of pressure fluid ensuring a power stroke, and a second end connected to a return flow conduit, the improvement of
at least one throttling plate member swingable about an axis located perpendicularly to said tube so as to be introducable edgewise thereinto,
a further hydraulic ram for swinging said at least one plate between a first position which leaves the cross section of said tube substantially unrestricted and a second position obtainable during a power stroke of said further ram, where said plate imparts a considerable restriction of said cross section,
said further hydraulic ram having a power stroke end and a return flow end,
a first conduit for connecting the power stroke end of said further ram with the return flow end of said first ram,
a second conduit for connecting the return flow end of said further ram with the power stroke end of said first ram, and
two oppositely directed non-return valves fitted in parallel in said first conduit.

4,413,555
PRESS FOR THE COMPRESSION OF LOADS

Dennis P. Swinney, Morpeth, England, assignor to Swinney Engineering Limited, Northumberland, England and Lanso Products Limited, Ramsey, Isle of Man

Filed Jun. 18, 1981, Ser. No. 274,806
Claims priority, application United Kingdom, Jun. 19, 1980, 8020008
Int. Cl.³ B30B *15/04*
U.S. Cl. 100—214 5 Claims

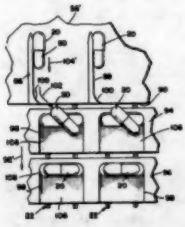


1. A press for the compression of a load comprising a frame (1) defining a compression area, a pressure member (3) movable relative to the load for compressing the load located within the compression area, means mounting said pressure member (3) to be able during compression to tilt about a first horizontal axis and to tilt about a second horizontal axis substantially perpendicular to said first horizontal axis so as to adopt different angular positions relative to the load whereby irregularity in the shape of the load may be accommodated, and guide means (26, 27, 28) for guiding the pressure member (3) during said movement, said guide means (26, 27) including, at each of two opposed sides of the pressure member, a projection portion (26) and a portion (27) receiving said projection portion, one of said portions being elongate and provided on the frame (1), and the other of said portions being on the pressure member (3).

4,413,556
MATERIAL ORIENTATION APPARATUS AND METHOD

Michael Ackley, 1273 N. Church St., Moorestown, N.J. 08057

Continuation of Ser. No. 954,243, Oct. 24, 1978, Pat. No. 4,266,477. This application May 11, 1981, Ser. No. 262,612
The portion of the term of this patent subsequent to May 12, 1998, has been disclaimed.
Int. Cl.³ B41F *17/36;* B65G *47/24*
U.S. Cl. 101—40 8 Claims



1. Apparatus for transporting and orienting pharmaceutical capsules comprising:

a rotatable drum having a plurality of spaced apart pockets each having a longitudinal portion adapted for carrying said capsules in an orientation substantially parallel to the direction of rotation of said drum;

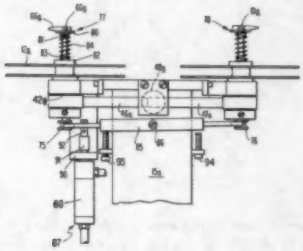
a back guide positioned adjacent said rotatable drum and extending over a selected arc length of said drum for retaining said capsules in said pockets and for releasing said capsules at a delivery point, said back guide having an arcuate side wall at said delivery point adapted to engage said capsules for shifting said capsules to an orientation at an angle to said direction of rotation of said drum at which said capsules are released by said back guide;

and transporting means positioned at said delivery point for receiving said released capsules.

4,413,557
RIBBON TYPE DATING EQUIPMENT

Charles E. Wade, Jr., 81 Myrtle Dr., Manahawkin, N.J. 08050, and Fred J. Rapp, 877 Main St., West Creek, N.J. 08092

Filed Mar. 28, 1980, Ser. No. 135,210
Int. Cl.³ B41F *17/24*
U.S. Cl. 101—44 10 Claims



1. In a ribbon dater:

frame means;

a pair of spaced apart drivers respectively rotatably mounted on said frame, each driver having an axially extending square hole, the holes being the same size;

means for incrementally rotating said drivers by the same amount simultaneously in opposite directions;

a pair of ribbon reels carrying a printing ribbon, each reel having an axially extending square hole of the same size as said driver holes, the reels being respectively removable disposed on said drivers with said square holes in axial alignment and the reels being adapted to be disposed on either driver;

a pair of elongated drive shafts, each having a square portion and a stem portion, the stem portion being of smaller cross section than the square portion and the square portion being the same size as said driver holes, the shafts being respectively disposed in said aligned holes;

positioning means operable to axially position each drive shaft to a reel-idle position or to a reel-drive position, in the reel-idle position the square portion of the drive shaft being disposed in the square hole of the driver for rotation therewith but spaced from the square hole in the reel whereby rotary motion of the driver and the drive shaft is not transmitted to the reel and in the reel-drive position the square portion of the drive shaft being disposed in the hole of the driver for rotation therewith and also disposed in the square hole of the reel whereby rotary motion of the driver and the drive shaft is transmitted to the reel;

printing means on said frame, said ribbon extending thru said printing means and the ribbon being moved thru the printing means by rotation of a drive shaft when in said reel-drive position; and

said positioning means providing for one drive shaft to be in the reel-drive position while the other drive shaft is in the reel-idle position for running said ribbon thru said printing means in one direction and for the reel-idle and reel-drive

positions of the respective drive shafts to be changed for re-running the ribbon thru said printing means in the reverse direction to thereby re-use the face of the ribbon effecting said printing.

4,413,558

LINE PRINTER AND TYPE CARRIER FOR USE THEREIN

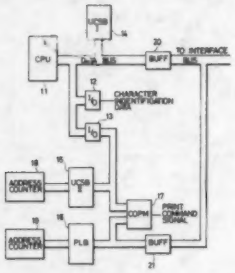
Hisayoshi Monma; Masao Miyasaka, and Kazuyuki Kubo, all of Ibaragi, Japan, assignors to Hitachi Koki Co., Ltd., Tokyo, Japan

Filed Oct. 6, 1981, Ser. No. 309,134

Claims priority, application Japan, Oct. 7, 1980, 55-140833; Feb. 20, 1981, 56-24566

Int. Cl.³ B41J *1/20*

U.S. Cl. 101—93.14 **11 Claims**



1. A line printer of the type capable of using a plurality of different type carriers each having a different array of N characters, and also having a memory for storing data for use in a printing operation, said data corresponding to the particular type carrier being used, for use in a printing system wherein a computer system transfers to said line printer a first data array corresponding to one of a plurality of different type carriers having an array of M characters, where M and N are unequal positive integers, said line printer comprising:

first memory means for receiving and storing said first data array from said computer system corresponding to an M-character type carrier; and

means for converting said first data array to a second data array corresponding to an N-character type carrier useable by said line printer and for storing said second data array for use in a printing operation.

4,413,559

MULTI-SPEED DRIVE FOR SCREEN PRINTING PRESSES

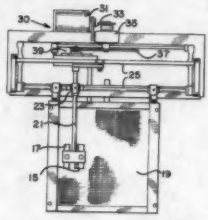
Henry J. Bubley, Deerfield, Ill., assignor to American Screen Printing Equipment Company, Chicago, Ill.

Continuation of Ser. No. 850,256, Nov. 11, 1977, abandoned. This application Jul. 30, 1982, Ser. No. 403,856

Int. Cl.³ B41F *15/14, 15/44*

U.S. Cl. 101—123 **9 Claims**

1. A screen printing press including a screen, an assembly arm positioned for reciprocating lateral movement above said screen during a print mode and a flood mode, a squeegee and a flood bar mounted adjacent one another on said assembly arm, said flood bar being functionally operative to provide a flood stroke during the flood mode as it is moved by said assembly arm in a lateral first direction across said screen and being functionally inoperative as it is moved in the opposite lateral direction across said screen, said squeegee being functionally operative to provide a print stroke during the print mode as it is moved in the opposite direction and being functionally inoperative as it is moved in the first direction, an electrically powered drive means including a direct current motor for driving said assembly arm, and said squeegee and flood bar, cam means driven by said electrically powered drive means having characteristics associated with the flood stroke and printing stroke, limit switch means operable by said cam means with movement of said assembly arm at the end of its travel in each of the first and opposite directions to cause a change in motor speed, first electrical current control means selectively associated with said limit switch means and said



direct current motor for controlling the speed of said drive means during the flood stroke, and ssecond electrical current control means selectively associated with said limit switch means and said direct current motor for controlling the speed of said drive means during the print stroke independently of the control provided by said first electrical current control means.

4,413,560

FLEXOGRAPHIC PRINTING PRESS

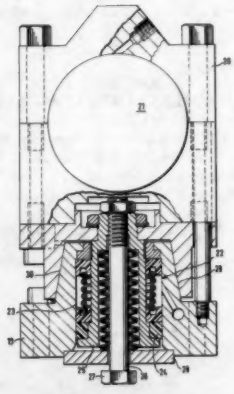
Dieter Rogge, Lengerich, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Oct. 10, 1980, Ser. No. 195,762

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1979, 2941521

Int. Cl.³ B41F *13/24, 31/00*

U.S. Cl. 101—247 **2 Claims**



1. In a flexographic printing press including an impression cylinder carrying a gear, a plate cylinder having a shaft carrying a gear, bearing means for supporting said plate cylinder shaft, a bearing block for supporting said bearing means for radial movement towards and away from said impression cylinder, an ink roller for applying ink to said plate cylinder and carrying a gear, an ink roller block for supporting said ink roller for radial movement towards and away from said impression cylinder, and means for moving said bearing block and said ink roller block into limit positions in dependence on the diameter of the plate cylinder so as to position the plate

cylinder and the ink roller in limit positions for performing a printing operation, the gears of said impression cylinder, said plate cylinder, and said ink roller being in full meshing engagement with each other during the printing operation, the improvement comprising:

means for moving said plate cylinder tangentially to said impression cylinder between the printing position and an inoperative position, said moving means acting on said bearing means so as to move said bearing means with respect to said bearing block; and

means for limiting the amount of movement of said bearing means by said moving means so that the gear carried by said plate cylinder shaft is in partial meshing engagement with the gear carried by said impression cylinder and the gear carried by said ink roller when said plate cylinder is in the inoperative position;

said gear of said plate cylinder being releasably securable on its shaft in a normal functioning position and being axially movable on said plate cylinder shaft so that when said plate cylinder is in its inoperative position said plate cylinder gear is movable from a position spaced from its normal functioning position into its normal functioning position in which the plate cylinder gear is in partial meshing engagement with the impression cylinder gear and the ink roller gear, said plate cylinder gear being movable into full meshing engagement by movement of said bearing means by side moving means to move the plate cylinder into the printing position.

4,413,561

INK FOUNTAIN DEVICES FOR PRINTING PRESS

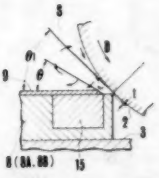
Hideaki Toyoda, Tokyo, Japan, assignor to Komori Printing Machinery Co., Ltd., Tokyo, Japan

Filed Mar. 2, 1982, Ser. No. 353,985

Claims priority, application Japan, Mar. 10, 1981, 56-34302

Int. Cl.³ B41F *31/04, 31/06*

U.S. Cl. 101—365 **2 Claims**



1. An ink fountain device for a printing press comprising:

an ink fountain roller;

an ink fountain frame inclined toward said ink fountain roller;

a plurality of divided blade sections juxtaposed on said ink fountain frame, with their adjacent sides in close contact;

a covering plate covering entire surfaces of said divided blade sections, said covering plate being made of magnetic material and being removably mounted on said divided blade sections;

a plurality of permanent magnets embedded in said divided blade sections for attracting said covering plate to said divided blade sections;

an inner end of said covering plate being spaced a predetermined distance from a periphery of said ink fountain roller and slanted downwardly; and

an angle between the slanted surface and upper surfaces of said covering plate being smaller than an angle between a tangent passing through a point on the periphery of said ink fountain roller confronting inner ends of said divided blade sections and the upper surfaces thereof.

4,413,562

CHAIN-TYPE TRANSPORT APPARATUS, FOR USE WITH PRINTING MACHINES

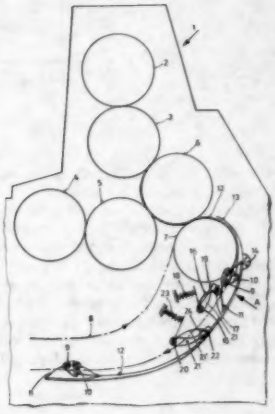
Hermann Fischer, Augsburg, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Mar. 22, 1982, Ser. No. 360,066

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1981, 3114581

Int. Cl.³ B41F *1/30*; B65H *29/04*

U.S. Cl. 101—408 **10 Claims**



1. Sheet transport apparatus for a sheet-fed rotary printing machine having a drum, or cylinder (7) from which a sheet (12) is to be transported, and defining a sheet delivery zone (A) adjacent thereto;

two endless transport chains (8) located at axial ends of the drum or cylinder;

cross struts (9) connecting the chains, located at spaced intervals thereon;

sheet grippers (10) located on the cross strut to grip the leading edge of the sheet (12) to be transported;

and comprising in accordance with the invention

means to prevent creasing, rolling-over or other uncontrolled movement of the trailing end of the sheet being transported comprising

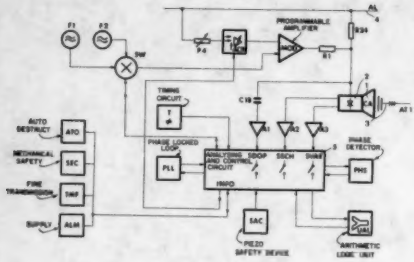
movable sheet guide elements (19, 22, 30, 34) located at least in said sheet delivery zone (A) and extending at least in part transversely to the movement of the sheet as it is being transported;

and movement control means (11, 16, 17; 25, 26, 27, 28) connected to and controlling movement of said movable sheet guide elements, in synchronism with rotation of the drum, or cylinder (7) between an inoperative position when the grippers (10) on the chain pass beneath said sheet guide elements and an operative position thereafter in which said sheet guide elements move to operative engagement with the portion of the sheet behind the leading end thereof gripped by said grippers, to control the position of said portion of the sheet on the chain conveyor.

4,413,563
ELECTRONIC FUSE FOR PROJECTILES

Roger Beuchat, Gland, Switzerland, assignor to Mefina S.A., Fribourg, Switzerland

Filed May 27, 1981, Ser. No. 267,551
Claims priority, application Switzerland, Jun. 2, 1980, 4253/80
Int. Cl.³ F42C *13/04*
U.S. Cl. 102—214 **5 Claims**

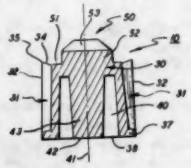


1. An electronic fuse for a projectile, having an emitter for producing a radar signal which is emitted in the form of a beam directed towards the front of the projectile on which the fuse is mounted, comprising: means for detecting a Doppler effect upon the radar signal; means for modulating the emitter of the radar signal by at least one frequency different from that of the emitted signal; means for sending at least one modulating pulse, which means for sending are rendered active by the appearance of the Doppler effect; means for analysing the modulated signal; firing means which are rendered active when the analysis of the modulated signal complies with predetermined conditions.

4,413,564
SLUG FOR A SHOTGUN SHELL

Worthy H. Brown, R.D. 7, Box 60, Fulton, N.Y. 13069

Filed May 1, 1981, Ser. No. 259,591
Int. Cl.³ F42B *13/24*
U.S. Cl. 102—501 **4 Claims**



1. A slug cast from a single piece of metal for use in a smooth bore shotgun, said slug comprising

a truncated conical body having a flat circular front face and a parallelly disposed flat rear face, the diameter of the front face being slightly less than the diameter of the rear face,

a series of circumferentially spaced, straight, fluted, rectangular shaped vanes projecting outwardly from the side wall of the body with the vanes being separated by channels, each vane extending obliquely between the front face and the rear face of the body with the top surfaces of the vanes describing a truncated cone, the pitch of the truncated cone of the vanes being steeper than the pitch of the truncated cone of said truncated conical body whereby the height of the vanes decreases from the front face to the rear face of the slug, said vanes move in interfering contact against the bore of the shotgun to impart a rotational motion to the slug as it moves therethrough, each vane further having a front tip that extends outwardly from the front face of said body and which terminates in a chisel point edge,

a blunt nose projecting forwardly from the front face of said body a greater distance than the chisel point edges on said vanes whereby the nose strikes a target before said chisel point edges,

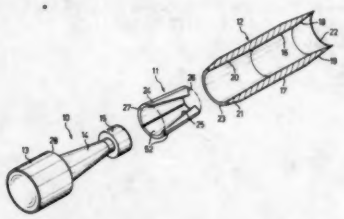
an annular ring at the rear face of the body that has an outer diameter substantially equal to the outside diameter of the cylinder described by the vanes whereby the ring closes each channel between the vanes, and

said body containing a blind hole passing inwardly from the rear face to a depth that is greater than one-half the axial length of the body whereby the slug has a nose heavy configuration.

4,413,565
PROJECTILE WITH A TUBULAR-SHAPED PROJECTILE BODY

Philippe Matthey, Arogno, Switzerland; Robert Salmon, St. Genis, France, and Niklaus Bühlmann, Thalwil, Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zurich, Switzerland

Filed Apr. 29, 1982, Ser. No. 373,122
Claims priority, application Switzerland, May 21, 1981, 3307/81
Int. Cl.³ F42B *13/16, 11/00*
U.S. Cl. 102—503 **12 Claims**



1. A projectile comprising:

a substantially tubular-shaped projectile body;

said tubular-shaped prjectile body having a rear end provided at an inner surface thereof with a substantially conical-shaped rearwardly widening inner wall defining a conical-shaped portion of the projectile body;

a sabot base portion positioned to cooperate with the rear end of said projectile body;

said projectile body bearing upon said sabot base portion during firing of said projectile;

said sabot base portion detaching from the projectile body upon exit of the projectile out of a firing weapon;

said sabot base portion containing a rearwardly widening substantially conical-shaped portion which extends into the rear end of said conical-shaped portion of the projectile body;

a substantially ring-shaped wedge member formed of at least two wedge parts arranged between said conical-shaped rearwardly widening inner wall of the projectile body and said rearwardly widening conical-shaped portion of the sabot base portion; and

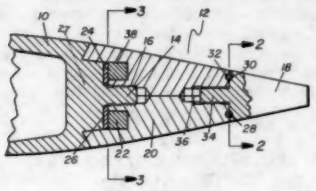
said at least two-part ring-shaped wedge member being of conical configuration at an outer surface and at an inner surface thereof.

4,413,566

NON-ABLATIVE PROJECTILE HEAT SENSITIVE NOSE

Alfred A. Loeb, Dover, and Robert G. Salamon, Boonton, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 31, 1981, Ser. No. 288,827
Int. Cl.³ F42B 9/20, 11/00
U.S. Cl. 102—517 5 Claims



1. A heat sensitive nose cap assembly for limiting the range of a fin-stabilized, hypervelocity, anti-armor training projectile which has passed a target which comprises:

a projectile body having a centrally positioned boss located on a front end and an axially alligned screw member integrally connected to said boss;

first thermal conductive means releaseably connected to said screw member of said projectile for maintaining an ogive geometry for said projectile during flight toward said target and for transferring aerodynamically generated heat which includes;

a pair of rear ogive members, having a centrally disposed forward threaded cavity therein, a centrally disposed rear threaded cavity, a semi-annular shaped groove operatively disposed in a front end of said rear ogive members, and a rear locking ring groove positioned in an aft end of said rear ogive members;

second thermal conductive means fixedly connected to said first thermal conductive means for preventing premature break-up of said projectile which includes;

a conically shaped forward ogive member threadedly attached to said rear ogive members, said forward ogive member having a semi-annular shaped groove operationally disposed opposite to the semi-annular grooves of said rear ogive members;

a forward locking ring positioned in said semi-annular grooves of said rear and forward ogive members; and

a threaded axially aligned rear end for fixedly engaging the centrally disposed forward threaded cavity of said rear ogive members, said forward ogive preventing the premature opening of said pair of rear ogive members during projectile setback;

a zinc alloy locking ring internally positioned in said projectile and operatively disposed in said rear locking ring groove under compressive radial stress approximately equal to the yield stress of said zinc alloy locking ring, for releaseably holding said first thermal conductive means attached to said projectile body for a specified period of time after launch of said projectile, said first thermal conductive means heating said zinc alloy locking ring and thereby changing the yield strength of said locking ring in response to the aerothermodynamic heating of said rear and forward ogive members, and breaking in response to the centrifugal forces generated by said fin stabilized projectile; and

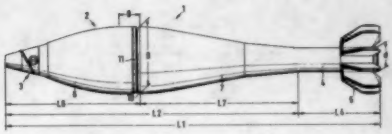
insulator means, operatively disposed intermediate said projectile boss and said zinc alloy locking ring for thermally isolating said zinc alloy locking ring from said projectile boss.

4,413,567

FIN-STABILIZED MORTAR GRENADE

Amos Frostig, Haifa, Israel, assignor to Etablissement Salgad, Vaduz Liechtenstein

Filed Sep. 8, 1980, Ser. No. 185,041
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1979, 2936408
Int. Cl.³ F42B 31/00
U.S. Cl. 102—525 5 Claims



1. A fin-stabilized mortar grenade comprising:

(a) an ogival body and a tail section having fin controlling surfaces,

(b) said body including a caliber diameter zone having at least one annular groove located therein,

(c) a spreadable sealing ring disposed within said annular groove,

(d) said sealing ring having an outside surface facing outwardly from said body, an inside surface facing the bottom of the annular groove and an edge bevel side surface extending outwardly a predetermined depth from said inside facing surface and disposed on the side of the sealing ring between the outside and inside surfaces and facing the rear of the shell body,

(e) said sealing ring includes a separation plane passing obliquely therethrough,

(f) said separation plane being at an angle of about 3° to 6° with respect to a principal plane of the ring which is perpendicular to the longitudinal axis of the ring,

(g) the sealing ring includes a further edge bevel side surface located between the outside and inside surfaces at the side thereof facing toward the forward portion of said shell body, and

(h) the inside surface of the ring and the bottom of the annular groove are both cylindrical,

(i) said sealing ring includes cross slots peripherally spaced along the inner side of the sealing ring,

(j) said cross slots having a depth corresponding to the extent of the ring thickness equal to the predetermined depth of said edge bevel surfaces, and

(k) said cross slots being effective to facilitate flow of propellant gases from the rear facing side to the forward facing side of the body portion.

4,413,568

METHOD OF AUTOMATICALLY OPERATING A SEMI-CONTINUOUS PASSENGER TRANSPORT SYSTEM USING PASSIVE VEHICLES, AND MEANS FOR IMPLEMENTING SAME

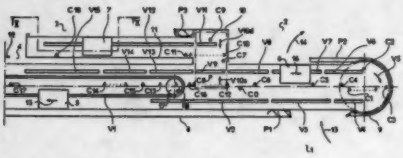
Jean Huon de Kermadec, Versailles, France, assignor to Soule Fer et Froid S.A., Bagneres de Bigorre, France

PCT No. PCT/FR80/00052, § 371 Date Nov. 26, 1980, § 102(e) Date Nov. 26, 1980, PCT Pub. No. WO80/02128, PCT Pub. Date Oct. 16, 1980
PCT Filed Apr. 3, 1980, Ser. No. 224,560
Claims priority, application France, Apr. 4, 1979, 79 08510
Int. Cl.³ B61B 13/12
U.S. Cl. 104—20 22 Claims

1. An automatic method of operating a semi-continuous passenger transport system having successive movable tracks for driving non-motorized vehicles along a closed path between at least two stations, said tracks including cruising speed tracks located between said stations, slow speed tracks at embarkation and disembarkation platforms located at each of said

stations, and transition tracks for accelerating and decelerating said vehicles at the ends of said platforms; said transport system further including structural means for limiting access of passengers to one of said vehicles located at one of said stations, said method comprising the steps of:

(1) detecting the presence of an object by actuation of said structural means, the presence of said object being defined as a fault condition;



(2) signaling said fault condition;

(3) stopping the track on which said one vehicle in said station is situated and stopping all other tracks in said station without stopping said cruising speed tracks; and

(4) cancelling steps (2) and (3) after said fault condition has been removed to progressively return said system to normal operation.

4,413,569

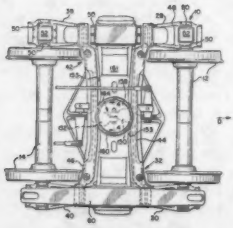
STEERING RAILROAD TRUCK

Harry W. Mulcahy, Griffith, Ind., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Continuation of Ser. No. 53,934, Jul. 2, 1979, abandoned, which is a continuation-in-part of Ser. No. 903,952, May 8, 1978, abandoned. This application May 7, 1981, Ser. No. 261,421

Int. Cl.³ B61B *5/38, 5/44;* **B61H** *13/00*

U.S. Cl. 105—168 **7 Claims**



1. A railroad car truck for carrying a body of a railroad car, said truck assembled from a pair of spaced side frames, a bolster transversely positioned between said side frames with end portions of said bolster resiliently carried in windows centrally located in said side frames respectively, a pair of steering arms located on each side of said bolster and between said side frames, each said steering arm having side portions positioned within pedestal jaws formed at ends of said side frames, said steering arms joined at a point proximate a center of said bolster to in part regulate movement of said arms by a connection including a bracket formed on each said steering arm and positioned in a side by side relationship with multi-directional pivot means interconnected therewith, and a pair of wheelsets each having axle ends journaled in bearings located within said steering arm side portions to form a respective unit comprising said wheelset and said steering arm, an improvement in said truck comprising,

an adapter carried one each on an upper portion of each said bearing and having a frustum-like shaped boss formed on an upper side of said adapter,

an outwardly extending part forming part of said steering arm side portion, said extending part having a horizontal member with a reverse frustum-like shaped recess on a bottom side of said horizontal member to receive said adapter boss and form a compressive joint therebetween, and a recessed receiving area in a top side of said horizontal member,

an elastomeric device having a lower portion disposed with a snug fit in said horizontal member receiving area, and

a recessed covering area formed in a roof of said side frame pedestal jaw for disposition with a snug fit of an upper portion of said elastomeric device, said elastomeric device spacing said steering arm-wheelset unit from said side frame to allow movement therebetween,

wherein steering forces generated between said wheelsets and trackage over which said truck may travel result in movement of each said steering arm-wheelset unit, said movements being regulated by said elastomeric device and said connection between said steering arms.

4,413,570

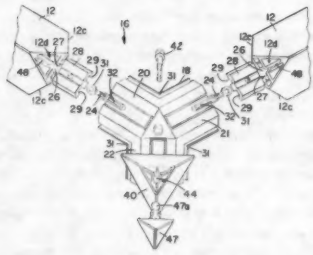
TABLE EASILY ASSEMBLED FROM STANDARDIZED PARTS AND CORNER CLAMPING ASSEMBLY USABLE THEREWITH

Paul Haigh, New York, N.Y., assignor to Knoll International, Inc., New York, N.Y.

Filed Feb. 27, 1980, Ser. No. 125,206

Int. Cl.³ A47B *3/06*

U.S. Cl. 108—153 **20 Claims**



1. An assembly for clamping a plurality of members securely together at a common corner, including an inner bracket having a plurality of arms each adapted to underlie an end portion of a respective member, means including first holding elements engaging respective arms for holding said members securely to said inner bracket, and an outer bracket adapted to fit over facing end surfaces of said members while being held securely thereover by a second holding element extending from said inner bracket generally in a direction centrally through the intersection of the longitudinal axes of said arms.

4,413,571

SOLID FUEL HOT WATER HEATER

Richard C. Hill, and Mark R. Daniele, both of Orono, Me., assignors to The Board of Trustees of the University of Maine, Bangor, Me.

Filed Jun. 29, 1981, Ser. No. 278,355

Int. Cl.³ F23G *5/00;* **F22B** *5/02*

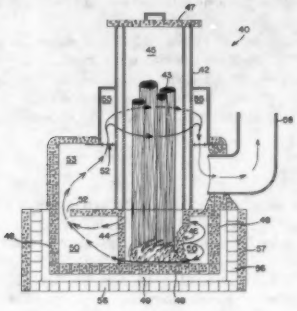
U.S. Cl. 110—234 **20 Claims**

1. A solid fuel hot water heater comprising:

primary combustion chamber means comprising a refractory material base portion including walls and a draft outlet, said base portion forming the locus of solid fuel combustion, said refractory material base portion comprising a "U" shaped or arcuate wall portion open on one side for drafting flue gases away from the locus of combustion, and water jacket means defining an upright portion over the refractory material base portion for receiving a charge of solid fuel in a generally vertical stack, said water jacket means including coupling means for coupling to a source

of water for at least convection circulation for confining the locus of solid fuel combustion to the base portion of the combustion chamber means;

flue gas delay channel means coupled with the combustion chamber base portion draft outlet, said delay channel means defining pathways around the outer periphery of the walls of the refractory material base portion, said delay channel means defined by refractory material and providing delayed propagation in a high temperature environment sufficient to afford substantially complete secondary burning of the gaseous products of combustion;



heat exchange channel means defining pathways around the outer periphery of the water jacket means in heat exchange relationship with said water jacket means for transfer of heat from the end products of combustion to the circulating water, said heat exchange channel means coupled to said flue gas delay channel means;

means for coupling a draft through the combustion chamber means, delay channel means and heat exchange means including draft outlet means from said heat exchange channel means;

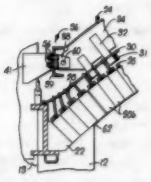
and means for admitting combustion air into said combustion chamber means.

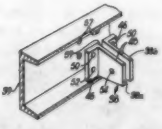
4,413,572

ADJUSTABLE SUPPORT ASSEMBLY FOR OPEN HEARTH FURNACE

John J. Musser, Kansas City, Mo., assignor to George P. Reintjes Company, Inc., Kansas City, Mo.

Filed Mar. 7, 1983, Ser. No. 472,729
Int. Cl.³ F23M 5/06
U.S. Cl. 110—331 **3 Claims**





1. In combination with a furnace chamber having spaced sidewalls, a roof for said chamber comprising:

a plurality of refractory blocks, each block having a lowermost, chamber directed face and a longitudinal length generally perpendicular to said face, said faces collectively comprising an arcuate top wall to said chamber and defining an arch that intersects said sidewalls at a boundary line;

a plurality of spaced beams arranged in pairs, each pair spanning between said sidewalls and each beam adapted at its outer end for pivotal coupling to one of said sidewalls, the inner ends of each pair of beams being pivotally interconnected;

support means of a given length depending from said beams and being operably coupled to said blocks for supporting said blocks;

a plurality of reversible brackets pivotally mounting said outer ends of said beams to respective sidewalls of said furnace, each bracket including

a sidewall-connecting portion having first and second, spaced apart, sidewall connection points defining a vertically oriented line and a centerpoint therebetween,

an arch-supporting portion having a beam connection point,

means for connecting said sidewall connection points to one of said sidewalls at first and second sidewall junction points and means for pivotally connecting the outer end of one of said beams to said beam connection point,

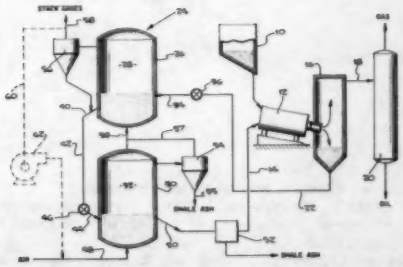
said beam connection point being vertically offset from said centerpoint, whereby said beam connection point is oriented in a first position when said first sidewall connection point is aligned with said first junction point and said second sidewall connection point is aligned with said second junction point, and said beam connection point is oriented in a second position vertically offset from said first position when said first connection point is aligned with said second junction point and said second connection point is aligned with said first junction point, thereby shifting the elevation of said outer end of said one of said beams to accommodate installation of said refractory blocks having varied longitudinal lengths without shifting the vertical orientation of said boundary line.

4,413,573

PROCESS FOR COMBUSTING CARBONACEOUS SOLIDS CONTAINING NITROGEN

Robert N. Hall, Boulder; Franklin B. Carlson, Broomfield, both of Colo., and William J. Thomson, Moscow, Id., assignors to Tosco Corporation, Los Angeles, Calif.

Filed Jun. 21, 1982, Ser. No. 390,756
Int. Cl.³ F23D 1/00
U.S. Cl. 110—347 **23 Claims**



1. A process for staged combustion of solids containing combustible carbonaceous material and nitrogen comprising the steps of:

passing said solids to a first combustion zone;

adding sufficient oxygen confaining gas to said solids in said first combustion zone to partially combust said carbona-

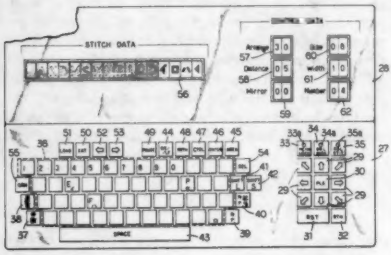
ceous material to produce partially combusted solids and flue gas;
separating said partially combusted solids from said flue gas;
passing said partially combusted solids to a second combustion zone;
adding sufficient oxygen containing gas to said partially combusted solids in said second combustion zone to combust substantially all of said carbonaceous material to produce combusted solids and flue gas containing oxygen and nitrogen oxides;
separating said combusted solids from said flue gas;
passing said second combustion zone flue gas to said first combustion zone to provide said oxygen containing gas to said first combustion zone, wherein the carbonaceous material in said first combustion zone is partially combusted and the amount of nitrogen oxides in said flue gas is reduced by the interaction of the nitrogen oxides with said solids in said first combustion zone.

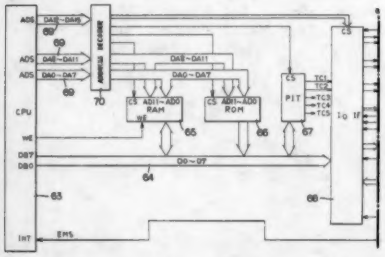
4,413,574

STITCH PATTERN SEWING MACHINE

Kunio Hirota, and Masao Shimomura, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Feb. 24, 1981, Ser. No. 237,421
Claims priority, application Japan, Mar. 5, 1980, 55-28394; Mar. 19, 1980, 55-37269
Int. Cl.³ D05B *21/00*
U.S. Cl. 112—121.12 **14 Claims**





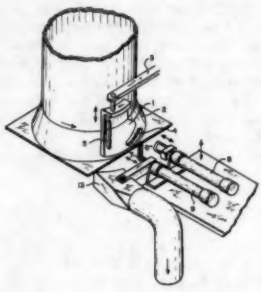
1. An automatic sewing machine comprising:
means for forming stitches on a workpiece, including a reciprocatory needle and a looptaker cooperating with said needle;
a workholder for holding said workpiece during sewing operation;
drive means connected to at least one of said workholder and said stitch forming means, and operative to vary the relative position between said workholder and said needle;
first memory means for storing plural blocks of unit pattern information each of which corresponds to respective predetermined plural unit stitch patterns, each of said plural blocks of unit pattern information consisting of a plurality of position data related to the relative position between said workholder and said needle;
first manually operable means for generating selection commands to select at least two desired blocks of unit pattern information from said first memory means;
second memory means for storing said selection commands generated by said first manually operable means in the order of the selection operation conducted through said first manually operable means;
second manually operable means to generate a command signal representative of the size of each of the individual unit stitch patterns selected by said selection commands; and
control means for modifiying the position data of the selected unit pattern information according to the command signal generated by said second manually operable means and supplying the modified position data to said drive means in timed relation with the reciprocation of said needle.

4,413,575

DEVICE FOR TRIMMING AN EDGE OF A TUBULAR TEXTILE ARTICLE

Vinicio Gazzarrini, Florence, Italy, assignor to Solis S.r.l., Florence, Italy

Filed Dec. 22, 1980, Ser. No. 218,911
Claims priority, application Italy, Dec. 24, 1979, 9634 A/79
Int. Cl.³ D05B *21/00*; B26D *7/10*
U.S. Cl. 112—129 **17 Claims**

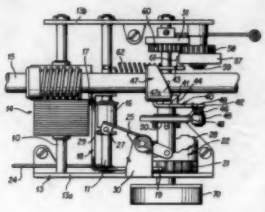


1. Device for trimming the unsewn edge of a tubular article, such as a pantyhose, prior to the sewing of a gusset thereon, comprising
an article support having a truncated cone shape for stretching the unsewn edge of the article, said support being rotatable in a horizontal direction;
a mask in the form of a shell concentric to a portion of said support fastened independently of said support but spaced a short distance therefrom for underlying the article when the article is in a position stretched over said support and for holding raised a piece of fabric which is to be trimmed from said annular support during the horizontal rotation of said support, said support having a first slot and a second slot;
two electric resistances, each separately introducible into said first and said second slots, one of said resistances cooperating with said first slot to achieve with the simultaneous horizontal rotation of said support the circumferential trimming of the fabric stretched thereon, and said other resistance cooperating with said second slot to achieve with said support in its stationary condition an opening in ribbon form of the annular piece of fabric detached by the aforesaid trimming; and
a suction mouth for the removal of the piece of fabric formed into a ribbon.

4,413,576
BUTTONHOLE DEVICE FOR A ZIG-ZAG SEWING MACHINE

Kazufumi Taguchi, Kariya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Apr. 1, 1981, Ser. No. 250,080
Claims priority, application Japan, Apr. 3, 1980, 55-43741
Int. Cl.³ D05B *3/06*
U.S. Cl. 112—158 B **7 Claims**



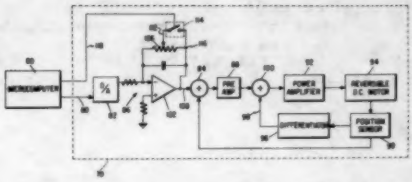
1. A buttonhole device for a zig-zag sewing machine comprising:
a main shaft;
a rotary shaft operatively associated with said main shaft;
means operatively connected to said rotary shaft for controlling lateral needle oscillation, needle position or base line and work feeding so as to produce various stitch patterns, and which is positionable at a plurality of positions wherein said plurality of positions further comprise a first position, a second position, a third position and a fourth position respectively corresponding to a first bar tack, a first side stitch, a second bar tack, and a second side stitch of a buttonhole,
a disc cam having formed thereon at a peripheral portion thereof a first and second recessed portion and which is fixedly mounted on said rotary shaft, a single ratchet wheel rotatably mounted on the rotary shaft adjacent said disc cam and having a plurality of teeth formed thereon,
pawl means reciprocably moved by said main shaft for advancing said ratchet wheel by engaging one of said plurality of teeth of said ratchet wheel to thereby automatically rotate said rotary shaft from said first position to said second position, and for engaging with said second recessed portion of said disc cam to thereby automatically rotate said rotary shaft from said third position to said fourth position, and control means mounted on said rotary shaft for preventing said pawl from engaging with said plurality of teeth of said ratchet wheel while said rotary shaft is positioned at said third position subsequent to being manually rotated from said second position.

4,413,577
PATTERN FEED BALANCING ARRANGEMENT IN AN ELECTRONICALLY CONTROLLED SEWING MACHINE

Philip F. Minalga, Piscataway, and John W. Wurst, Chester Township, Somerset County, both of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Nov. 8, 1982, Ser. No. 439,695
Int. Cl.³ D05B *3/02*
U.S. Cl. 112—158 E **5 Claims**

1. In an electronically controlled sewing machine having stitch forming instrumentalities positionally controlled over a predetermined range between stitches to produce a pattern of feed and bight controlled stitches, said stitch forming instrumentalities including a feed regulating mechanism positionable for two directions of feed; means for storing pattern stitch feed and bight information; means operating in timed relation with said sewing machine for extracting said pattern stitch information from said storing means; separate feed and bight actuating means responsive to said extracted pattern stitch information for influencing the feed and bight motions, respectively, of said stitch forming instrumentalities to produce a pattern of stitches corresponding to said extracted pattern stitch information; and an operator actuable and influencable feed override means for selectively attenuating the response of said feed actuating means to the extracted feed information;
an arrangement for utilizing said feed override means to effect a feed balancing function for a pattern having both directions of feed comprising:

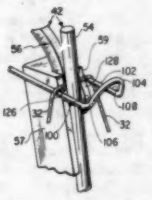


means responsive to operator actuation of said feed override means for operating on the extracted feed information for only one of said feed directions to increase the feed motion for said one feed direction; and
means responsive to operator actuation of said feed override means for making effective operator influence of said feed override means for only said one feed direction.

4,413,578
CAMMING ARRANGEMENT FOR THREAD HANDLING DEVICE

Donald Rodda, Butler, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Sep. 24, 1982, Ser. No. 422,770
Int. Cl.³ D05B *49/00*
U.S. Cl. 112—254 **7 Claims**



1. In a sewing machine wherein a sewing needle and looptaker cooperate in the formation of lockstitches in a fabric, the combination comprising: a thread source; thread tensioning means to which thread extends from the thread source; a thread handling device into which thread extends from the tensioning device and beyond which the thread extends to the needle, the thread handling device including an elongate rigid member and a fiber supporting strip from which resilient fibers project outwardly toward said rigid member to contact the thread in the thread handling member; a takeup for setting stitches and pulling thread through the tensioning device from the supply, the takeup being movable upwardly with thread to a stitch setting position at one end of its operating range whereat the thread is disposed for temporary retention by said thread handling device, and movable downwardly free of the thread to the other end of said operating range to enable thread to move in the thread handling device away from the temporary retention position to a position of reengagement with the takeup at said other end of its operating range and during such movement shorten the path for thread between the tensioning device and needle to supply a quantity of thread for use by the needle and looptaker; and a pair of cams in the thread path which bracket the thread handling device and have edges engageable outwardly from the fibrous strip with downwardly moving thread, one of the cams being contoured to cause the

thread to move downwardly thereon in advance of the other and to prevent the downwardly moving thread from becoming slack.

4,413,579

BOBBIN CASE RETAINING MEANS

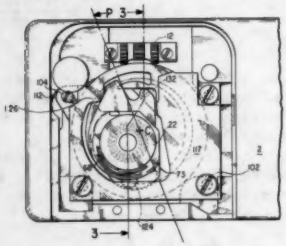
Ralph E. Johnson, Convent Station, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Jun. 19, 1981, Ser. No. 275,168

The portion of the term of this patent subsequent to Oct. 6, 1998, has been disclaimed.

Int. Cl.³ D05B *57/14, 57/26*

U.S. Cl. 112—184 **5 Claims**



1. A sewing machine having a work supporting bed, a loop taker arranged for rotation about a vertical axis, said loop taker having a rim including a thread seizing beak formed therein, a bobbin case within said loop taker, a bracket removably attached to said bed and with said loop taker providing the sole support for constraining said bobbin case rotationally, radially, and vertically said bracket loosely connect to said bobbin case to permit the passage of thread between said bobbin case and said bracket during the formation of lockstitches, said bobbin case being vertically supported only at a first location on said bracket and at a second location on said rim of said loop taker, said second location having less than 180° of angular displacement, said bracket being of unitary integral construction having a vertical wall adjacent said first location on said bracket for loosely abutting said bobbin case, said bracket overlaying a portion of said bobbin case in third and fourth spaced apart locations, said second, third, and fourth locations being positioned on one side of a plane containing said vertical axis of said loop taker and said first location being positioned on the other side of said plane whereby said bobbin case is retained in operational engagement with said rim and removal of said bobbin case is prevented without removal of said bracket.

4,413,580

METHOD FOR FORMING FABRIC TUBES

James D. Moyer, and Robert S. Hoffert, both of Winchester, Va., assignors to Midwestco, Inc., Niles, Ill.

Division of Ser. No. 86,141, Oct. 18, 1979. This application May 29, 1981, Ser. No. 268,634

Int. Cl.³ D05B *97/00*

U.S. Cl. 112—262.2 **12 Claims**

1. A method of forming a tubular fabric bag with ends square to the length of the bag comprising:

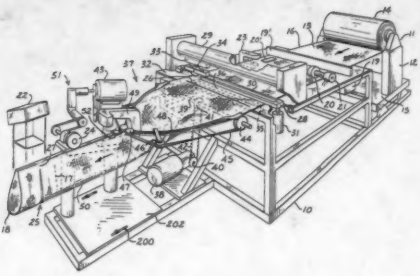
feeding a flat sheet of fabric material along a predetermined path of travel,

stopping the feeding of said sheet and cutting said sheet across a substantial portion of its width along a line that is spaced inwardly of each edge of the sheet,

resuming feeding of the sheet along said path, then folding the edges of the sheet into a seam with the cut line precisely aligned on opposite sides of the seam so that the bag after its seam is sewn can be separated by snipping through the seam as well as any uncut material adjacent the seam to provide a bag with precisely square ends, and sewing the seam.

7. A method of automatically forming a fabric filter bag tube comprising:

feeding a flat sheet of fabric material along a predetermined path;



frictionally gripping the sheet adjacent each side edge;

bringing said edges together while the sheet is moving;

overlapping said edges; and

stitching through said overalpped edges to form a sewn seam.

4,413,581

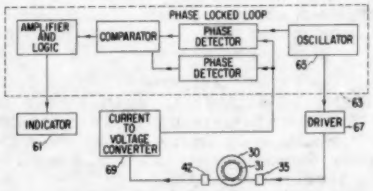
OPTICAL SWITCHING ARRANGEMENT FOR A SEWING MACHINE

William W. Logan, Glen Ridge, N.J., assignor to The Singer Co., Stamford, Conn.

Continuation-in-part of Ser. No. 364,129, Mar. 31, 1982, abandoned. This application Apr. 7, 1983, Ser. No. 482,743

Int. Cl.³ B65H *63/02;* **D05B** *51/00, 3/06*

U.S. Cl. 112—278 **10 Claims**



1. A sewing machine having a frame including a bed, said bed having a cavity for receiving a loop taker, a loop taker rotatably supported in said cavity, a bobbin case supported in said loop taker against rotation therewith, said bobbin case freely supporting a lower thread carrying bobbin therein, and means for sensing the thread carrying condition of said bobbin, said sensing means including a light source and a light detector, wherein the improvement comprises:

means for providing a modulation signal;

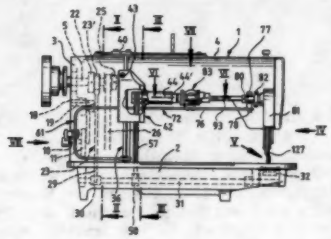
means utilizing said modulation signal for driving said light source; and

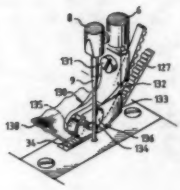
means utilizing said modulation signal for examining the output of said light detector.

4,413,582
WORKPIECE FEEDING DEVICE FOR A SEWING MACHINE

Günter Landwehr, and Horst Thiele, both of Bielefeld, Fed. Rep. of Germany, assignors to Kochs Adler AG, Bielefeld, Fed. Rep. of Germany

Division of Ser. No. 77,143, Sep. 19, 1979, Pat. No. 4,271,776.
This application Oct. 1, 1980, Ser. No. 192,912
Int. Cl.³ D05B 27/06
U.S. Cl. 112—311 2 Claims



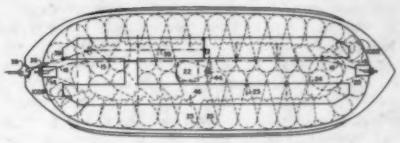


1. In a sewing machine having a workpiece supporting base plate, a standard and an overhanging arm carrying a presser bar, a movable needle and a longitudinally extending arm shaft for driving said needle, a workpiece feeding device having a mechanism synchronously driven relative to said needle and including an adjustable eccentric, means for adjusting said eccentric, a rock shaft pivoted in said base plate, a crank fastened to said rock shaft and a pitman, the upper end of which cooperating with said eccentric and the lower end of said pitman linked to said crank; a lower feeding means including a lower feeding element arranged to engage in a steady contact the lower surface of a workpiece, means for driving said lower feeding element comprising an intermediate shaft journaled in said base plate, means drivingly connecting said rock shaft with said intermediate shaft including at least one one-way coupling, an output shaft journaled in said base plate and drivingly connected to said upper feeding element, and a lower device having a clutch coupling and a reversing gear alternately connecting said intermediate shaft with said output shaft, and control means including a feed reversing regulator and connecting elements shiftably connecting said feed reversing regulator with said clutch coupling and said reversing gear; and an upper feeding means including an upper feeding element arranged to cooperate with said lower feeding element in the area of said needle in a steady contact with the upper surface of said workpiece, a bracket secured to said presser bar carrying said upper feeding element, and means for driving said upper feeding element comprising a housing clamped to a vertical bar fastened to said standard, a first shaft pivoted in said housing, coupling means including at least one one-way coupling arranged on said first shaft, a driving connection between said rock shaft and said coupling means, a second shaft pivoted on said overhanging arm and drivingly connected to said upper feeding element, and a device having said clutch coupling and said reversing gear alternately connecting said first shaft with said second shaft by means of shifting means, and elements shiftably connecting said shifting means with said control means.

4,413,583
PLASTIC LIFEBOATS

William E. Elling, Metuchen, N.J., and by Hanny M. Elling, executrix, St. Louis, Mo., assignors to Hanny M. Elling, St. Louis, Mo.

Filed Dec. 18, 1979, Ser. No. 104,798
Int. Cl.³ B63B 43/02; B63C 9/02
U.S. Cl. 114—350 10 Claims



1. A fiberglass-reinforced plastic (F-RP) lifeboat with a totally rigid and watertight cover, without thwarts or other athwartship bracing above the floor level, except a single thwart towards amidship adjacent to each end-hoisting bulkhead at seat level, with a longitudinally level seat along each gunwale and with a level, continuous double width, longitudinal center seat, being slightly raised above the side seats, thus creating an aisle on each side allowing free walking without hindrance for the entire inside length; and said watertight cover being made in five sections; (a) one symmetrical and slightly cambered center section; (b) two symmetrical side sections; (c) two symmetrical end hoods, each with a hook well; and zigzag formed flanges between the sections remaining perforce flush one to the other on the underside, acting as cover stiffeners and offering a firm handhold for gunwale and deck walkers; and a triple flanged joint between gunwale top, inner hull flange and said symmetrical side section for the watertight connection of the rigid cover to the basic lifeboat hull; and part of said triple flanged joint being the gunwale top connection between outer hull and inner hull at top, forming a gutter-like depression for its entire length, with an overboard drain at midship on each side; and a hook release swing area with a watertight hinged observation window in said hook well; a small service hatch in each end hood or starboard aft and on port side forward, the end hoods therefore remaining alike and symmetrical; one elongated, transport observation dome at midship center on cover top, fitted with two hand wipers being operated from the inside; on each side of center line top a sprinkler water pipe with cocks at the pilot seat; right and left slanted cover stanchions, under the longitudinal zigzag stiffener on each side; pre-installed davit cable gripefitting anchor bolt nuts on the underside of the inner hull flange for later insertion of fitting; a vertical and level rudder installation to suit quadrant gear tiller pinion shaft, pointing to port side, away from the hoist hook and passing through a watertight bushing in said cover-end hood with a cable drum at its end leading over fairlead sheaves to a cable drum at the lower end of a vertical steering column being a sleeve on stanchion under the roof which has the pilot's steering stick at its upper end; a support girder under the inner hull strength floor stringer, being substantially connected by bolted structure and by steel clips, welded to a back bone bilge pipe, and resting on the plastic keel; universal ball joints, intraconnected within a tubular rod for the simultaneous release of hoist hooks at each end of the lifeboat; each joint comprising a metal sphere or ball, with two cross center holes to suit three pins, the ball diameter to suit the inside diameter of the tubular rod without tolerance; the rod ends resembling ears with pin holes in their center; a bow pull propeller, having a horizontal shaft, three blades with disk stumps held loosely in a three piece hub shell; and the disk of each said blade resting on one of the hexagon sides of a center piece, said center piece having been bored to suit the

shaft and two threaded rings holding the three-piece threaded shell together; a deflated rubber side tube stowed under a protective, portable rigid cover on each side of the boat, ready to be inflated at a moment's notice by pulling a dowel release cable and by opening a pressure air valve, both from the pilot station, resulting in the automatic abandonment of said protective covers by having same pushed out of the way when the air pressure is filling the tubes; a heavy steel flywheel, comprising two rings, one on top of the other, with a base plate between the rings, a vertical shaft extending from a keel pipe to the center seat above, with a hub and two levels of drive pins, said pins being engaged by the teeth of two saber blades on each level, said blades reciprocating back and forth, activated by sixteen pull lines from seated occupants; said saber blades being intraconnected within two endless cable rings; said top ring on the base plate having on its periphery an endless tooth rack for pinion power take-offs; engaging and disengaging of such power take-offs being controlled by the pilot and including the following pinion drives: diesel engine starting, centrifugal water pump, light bulbs, air pump, radio receiving, radio transmitting, power take-off drives through worm gears for the pull propeller and the pressure water pump from the vertical shaft of the flywheel; furthermore, on the end of said vertical shaft, a hand safety crank for quick emergency use and a hand brake to stop the wheel; tubes installed for passing air or wires through side air tank spaces to be foam-filled later; in addition to a regular lap seat belt, two sandal foot straps on the floor and two hand hold straps on a seat stringer.

4,413,584

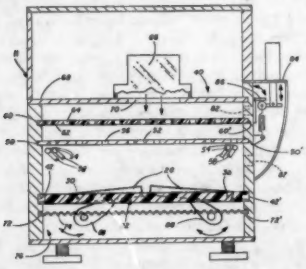
BIOLOGICAL SLIDE STAINING APPARATUS

Joseph P. DiMaggio, Jr., Bergenfield; Henry Eng, Clifton; Donald A. Ball, Warren, and Kenneth J. Walenciak, Wayne, all of N.J., assignors to A.J.P. Scientific, Inc., Clifton, N.J.

Continuation-in-part of Ser. No. 897,884, Apr. 19, 1978, Pat. No. 4,274,359. This application Jun. 2, 1981, Ser. No. 269,079

Int. Cl.³ B05C *11/12, 13/02*

U.S. Cl. 118—56 **9 Claims**



1. In an apparatus for staining biological slides comprising,

a support housing,

a slide conveyor assembly mounted within said support housing,

a slide tray for holding a plurality of slides removably insertable into said support housing,

a stain dispensing assembly disposed within said housing with a plurality of dispensers located to be above said slide support tray when said slide support tray is fully inserted into said support housing, and

a stain removal assembly located within said support housing and adjacent said dispensers, said stain removal assembly including a fluid drain component and a fluid evaporation component;

the improvement wherein said slide support tray consists essentially of:

at least two slide shelves mounted along parallel, laterally opposed pivot axes enabling said slide shelves to rotate away from each other in the same plane, said pivot axes so positioned when said slide support tray is fully inserted in said support housing that said slide shelves are adapted to cooperate with said stain removal assembly to tilt upward in a plane transverse to the plane in which said slide support tray resides within said support housing.

4,413,585

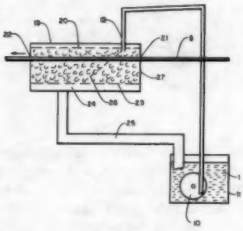
PROCESS AND ARRANGEMENT FOR APPLYING AND DRYING LIQUID LUBRICANT

Harri Weinhold, Kreischa; Heinz-Rüdiger Vogel; Bernhard Kurze, both of Dresden; Joachim Schiegel, Freiberg; Dieter Rauschenbach, Dresden; Roland Hering; Peter Werner, both of Mittweida, and Heinz Wünsch, Lauenhain, all of German Democratic Rep., assignors to Veb Schwermaschinenbau Kombinat "Ernst Thalmann"Magdeburg, Magdeburg, German Democratic Rep.

Filed Jul. 17, 1980, Ser. No. 169,931

Int. Cl.³ B05C *3/12*

U.S. Cl. 118—61 **12 Claims**



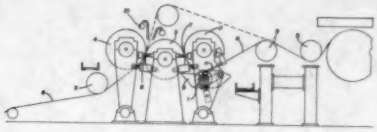
1. An arrangement for applying and drying a liquid lubricant on a metallic material to be mechanically worked, particularly a lubricant including an organic solvent and a solid or semi-solid lubricating substance, the arrangement comprising a closed coating container arranged to accommodate a lubricant, said coating container forming a part of a closed lubricant circuit and having inlet and outlet openings so that a metallic material passes through said coating container via said openings and the lubricant coats the metallic material whereupon the latter exits from the coating container through one of said openings, said coating container having a sieve located in the interior of the same and a granular material arranged above said sieve and in the region of said inlet and outlet openings, so that a lubricant collecting zone is formed below said sieve, and coating container also having a lubricant supply opening which opens into said granular material above said sieve, and a lubricant discharge opening which leads from said lubricant collecting zone below said sieve; means for removing the superfluous portion of lubricant which exits via said one opening without contacting the superfluous portion of lubricant with outside air; a drying channel located downstream of said removing means and said coating container and arranged to pass the lubricant coated metallic material therethrough; means for urging air through the interior of said drying channel and connected with the latter; and means for disturbing the air in said drying channel.

4. An arrangement as defined in claim 1; and further comprising solvent recuperating means connected with said drying channel.

4,413,586
SIZE PRESS

Albert Wöhrle, Heidenheim, Fed. Rep. of Germany, assignor to J. M. Voith GmbH, Heidenheim, Fed. Rep. of Germany

Filed May 20, 1982, Ser. No. 380,246
Int. Cl.³ B05C 1/08, 3/12
U.S. Cl. 118—206 5 Claims



1. A size press for depositing a bath of size on a moving paper web, comprising:

a first roller being rotatably mounted therein,

a trough member adapted to contain a first sump of liquid and having at least a portion of said first roller disposed therein,

a second roller being rotatably mounted therein and arranged substantially parallel to said first roller, said first and second rollers being spaced apart to form there between a first gap, said first roller being adapted to apply a predetermined amount of liquid to one side of the paper web at said first gap,

a third roller being rotatably mounted therein and arranged substantially parallel to said second roller, said second and third rollers being slightly spaced apart to form there between a second gap at a first predetermined distance from said first gap to allow liquid applied to the one side of the paper web to penetrate therein, said second roller and said third roller being adapted to squeeze excess liquid from the paper web at said second gap, and

a fourth roller being rotatably mounted therein and arranged substantially parallel to said first, second and third rollers, said fourth roller being adjacent to and spaced from said third roller to form a third gap therebetween at a second predetermined distance from said second gap to allow the paper web to reach a state of high absorbability, said fourth roller being further arranged relative to said third roller to provide a space adapted for receiving a second sump of a second liquid between respective outer surfaces of said third and fourth rollers, whereby the opposite side of the paper web has the second liquid applied thereto and the excess liquid squeezed therefrom when moved through said third gap,

said first gap and said third gap being adapted to continuously support therebetween the paper web.

4,413,587
CAN OR TUBE ADHESIVE APPLICATOR

Ronald Cook, Marquand, Mo., assignor to Tools & Machinery Builders, Inc., Arcadia, Mo.

Filed Sep. 14, 1981, Ser. No. 302,067
Int. Cl.³ B05C 1/02, 7/06
U.S. Cl. 118—210 6 Claims

1. An apparatus for applying substantially uniform amounts of adhesive or sealant material to container members, said apparatus comprising:

(i) container means;

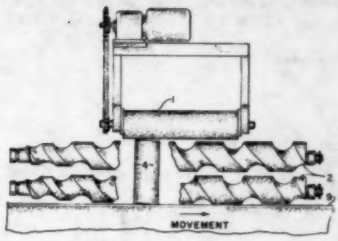
(ii) means communicating with said container means to apply a controlled quantity of adhesive from said container means to an adhesive applicator;

(iii) means to position and rotate said adhesive applicator;

(iv) two (2) spiral timing screws, one mounted above the other in a generally parallel orientation and each having a spiral groove sufficient to grip a container member;

(v) said spiral timing screws being adjustably positioned to both accept container members at regular intervals and to move said containers past and the top of said container members in contact with said adhesive applicator in order to apply one or more beads of adhesive to said container member;

(vi) means connected to said timing screws to control the rate of rotation thereof, means to adjust to a desired differential the number of degrees of relative rotation of one timing screw to the other for a given rate of rotation, so that said container member being advanced into the grooves of said timing screws may be tilted through a range of angles by said timing screws;



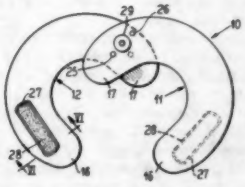
(vii) positioning means to position the center line of said container member relative to the center line of the adhesive applicator as said container member is advanced past said adhesive applicator; and

(viii) means spaced from said timing screws and below the adhesive applicator to receive the container member therebetween and to rotate said container member while said container member is being advanced by said timing screws past the adhesive applicator.

4,413,588
ANIMAL RESTRAINT COLLAR

Donald W. Lindholm, 15368 Betty Ann La., Oak Forest, Ill. 60452

Filed Jun. 17, 1982, Ser. No. 389,382
Int. Cl.³ A01K 15/04, 27/00
U.S. Cl. 119—106 12 Claims



1. An annular radial animal restraint collar adjustable to snugly fit a wide size range of animal necks to be held on the neck between the animal's head and shoulders and project radially for restraining the animal against digging under or squeezing through fences which comprises a pair of rigid flat U-shaped mats each having a bight portion and a pair of legs extending from the bight portion having curved outer peripheries, one leg of each mat having a plurality of holes spaced along the length thereof, the other leg of each mat having a strip of fibers secured thereon with the fibers of the strips interlocking when the strips are pressed together, the legs containing the holes being overlapped with a selected hole of one leg aligned with a selected hole of the other leg, a removable pivot pin seated in the aligned holes accommodating swinging of the mats from a closed position with fiber strips overlapped in selected positions to an open position with the strip carrying legs spaced apart opening a gap facilitating easy application and removal of the collar from the animal's neck,

the selected alignment of the holes, and the selected overlapping of the fiber strips varying the closed size of the collar without projecting the curved outer peripheries of the legs substantially beyond the outer peripheries of the bight portions.

4,413,589

COLLAPSIBLE ANIMAL LEASH

Theodore J. Bielen, Jr., and Denise M. Bielen, both of 1024 Amito Ave., Berkeley, Calif. 94705

Filed Apr. 30, 1982, Ser. No. 373,358
Int. Cl.³ A01K *27/00*
U.S. Cl. 119—109 **6 Claims**

1. A collapsible animal leash for attachment to an animal collar comprising:

a. an endless loop member;

b. means for releasibly holding a majority portion of the endless loop member to itself and fully collapsing said majority portion of said endless loop member, said fully collapsed majority portion of said endless loop member being free of exposed loops;

c. handle means formed from a majority portion of the endless loop member not capable of being held to itself by said means for releasibly holding a portion of said endless loop member;

d. means for connecting said endless loop member to the animal collar; said handle means being capable of serving as a proximal portion of said endless loop member in relation to the animal collar when said endless loop member is in a collapsed configuration, said handle means further being capable of serving as the distal portion of said endless loop member in relation to the animal collar when said endless loop member is in an uncollapsed configuration without disconnection of said endless loop member from the animal collar.

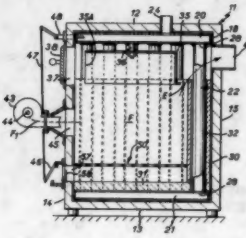
4,413,590

BOILER FOR A HEATING SYSTEM

Andre Landreau, Fontenay-le-Comte, France, assignor to Jean Mingret, Bressuire, France

Filed Nov. 21, 1980, Ser. No. 209,062
Claims priority, application France, Nov. 23, 1980, 79 28884
Int. Cl.³ F22B *5/02*
U.S. Cl. 122—18 **14 Claims**

1. A selectively solid or liquid fuel boiler for a central heating system, said boiler comprising a combustion chamber, means for selectively supplying liquid or solid fuel and combustion supporting gas to said combustion chamber, a heat exchanger for connection to a heating fluid circuit, said heat exchanger including upper and lower headers and a plurality of straight, parallel spaced-apart tubular elements interconnecting said headers for the flow of heating fluid therebetween, said tubular elements being disposed along the back and lateral sides of said combustion chamber, said tubular elements being embedded in refractory material along the major part of their length from their lower ends upward, said refractory material being positioned for direct contact with a burning solid fuel for maximum solid fuel efficiency, interstitial spaces being formed



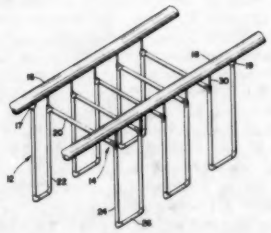
between said tubular elements and the surrounding refractory material to permit uninhibited expansion of said tubular elements with exposed upper parts of said tubular elements being positioned for direct contact with flue gases produced in said combustion chamber for maximum heat transfer efficiency with a liquid fuel.

4,413,591

SUPERHEATER HANGER DESIGN

Gary E. McCorcle, Odessa, Tex., assignor to El Paso Products Company, Odessa, Tex.

Filed Feb. 26, 1982, Ser. No. 352,705
Int. Cl.³ F22B *15/00, 25/00, 37/10*
U.S. Cl. 122—235 R **4 Claims**



1. In a boiler having disposed therewithin a superheater unit which comprises a spaced succession of upright U-shaped piping elements in the longitudinal direction and a spaced succession of inverted U-shaped piping elements in the transverse direction, each of said inverted elements comprising a straight horizontal crossover piping length between vertical portions of a pair of said upright elements and all said inverted and upright elements being connected to provide flow connection from an inlet to an outlet, an improved support means for suspending said superheater unit from support surfaces disposed outside of said boiler and for preventing said piping elements from exceeding their bending moment and becoming distorted because of thermal expansion and contraction caused by thermal changes taking place in said boiler during superheating of a fluid passing through said superheater unit from said inlet to said outlet, said support means comprising:

A. a plurality of lower pivot means, one said pivot means being attached to each end of each said crossover piping length;

B. a plurality of slide brackets, each said slide bracket being attached to said support surfaces and in approximately vertical alignment with one said lower support means; and

C. a plurality of hanger rods, each being pivotally mounted

on one said lower pivot means at its lower end and being pivotally and slideably attached within one said slide bracket at its upper end,

whereby said hanger rods are spaced along two spaced-apart rows and said superheater unit is provided with completely balanced and independent support at a plurality of points which are in both longitudinal and transverse arrays.

4,413,592

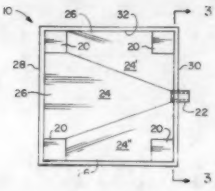
WATER DAMAGE PREVENTER PAN

George D. Jones, 4926 Harford Rd., Baltimore, Md. 21214

Filed Sep. 29, 1982, Ser. No. 428,134

Int. Cl.³ F22B *37/24*

U.S. Cl. 122—510 **8 Claims**



1. In a system of a pan with bottom, a rim and a drain for catching spillage from an appliance and draining same away, the improvement comprising: said bottom sloping to said drain from all points, and a plurality of blocks around the perimeter of the pan within said rim, said plurality of blocks having co-planar tops.

4,413,593

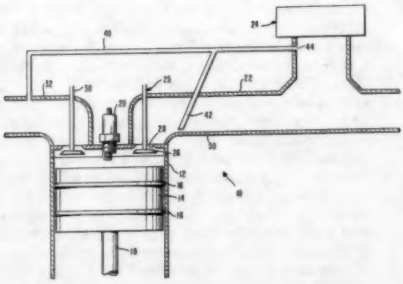
COMBUSTION CONTROL BY PRESTRATIFICATION

Edwin L. Resler, Jr., Ithaca, N.Y., assignor to Cornell Research Foundation, Inc.

Continuation-in-part of Ser. No. 163,898, Jun. 27, 1980, abandoned, which is a continuation-in-part of Ser. No. 140,932, Apr. 16, 1980, abandoned. This application Dec. 1, 1981, Ser. No. 326,237

Int. Cl.³ F02B *17/00*; F02M *25/06*; F02B *27/08*

U.S. Cl. 123—1 A **14 Claims**



14. A prestratified charge for a working cylinder of a turbocharged internal combustion engine operating on the Otto cycle, said charge enabling the engine to operate with a fuel having a permissible compression ratio less than the compression ratio of the engine, the charge comprising:

a first substantially undiluted portion having a pressure P_o at a given power level of the engine,

a second diluted portion differing in composition from said first portion by the addition of a diluent gas supplied to increase the manifold pressure to P_o^*, said second portion forming a region of diluent charge to produce a prestratification of the charge, the pressure of said diluted portion being increased by the addition of diluent gas by the ratio P_o^*/P_o defined as

$$\frac{P_o^*}{P_o} = \frac{\eta_{PCR}}{\eta^*(A/F)_{PCR}}$$

$$\left[\frac{CR^*(q/C_vT_o)}{(PRC)^{\frac{q}{C_vT_o}}\frac{}{(A/F+1)_{PCR}} + (PCR)^{\gamma} - (CR^*)^{\gamma}} - 1\right]$$

where CR^* is the prestratification controlled compression ratio for the fuel, η_{PCR} is the engine efficiency without prestratification; PCR is the permissible compression ratio without prestratification, A/F the air fuel ratio without prestratification, C_v the heat capacity of the combustion mixture at constant volume; q the heating value of the fuel; T_o the cylinder inlet or manifold temperature; η^* is the engine efficiency with prestratification; and γ is the ratio of specific heat at constant pressure to the specific heat at constant volume, and wherein the ratio P_o^*/P_o is caused to be substantially larger than 1.1, whereby the engine will operate on said charge without knock.

4,413,594

METHOD AND APPARATUS FOR STARTING AN ALCOHOL ENGINE

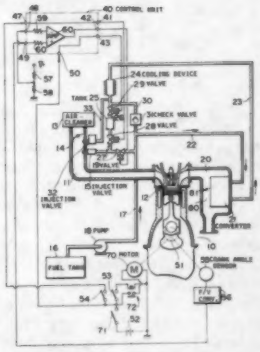
Toshio Hirota, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 18, 1982, Ser. No. 340,276

Claims priority, application Japan, Mar. 19, 1981, 56-38734

Int. Cl.³ F02B *43/08*; F02M *13/06*

U.S. Cl. 123—3 **15 Claims**



1. An apparatus for starting an alcohol engine equipped with a starting motor, comprising:

(a) a converter supplied with alcohol for converting it into a high-temperature gaseous mixture containing a relatively highly volatile substance;

(b) a cooling device connected to the converter for receiving the high-temperature gaseous mixture and cooling it to produce a liquid condensate including the relatively highly volatile substance;

(c) a passageway connecting the cooling device to the engine for supplying the liquid condensate to the engine as fuel;

(d) a valve disposed in the passageway for selectively interrupting and effecting the supply of the liquid condensate to the engine;

(e) means for sensing whether the starting motor is in operation or at rest; and

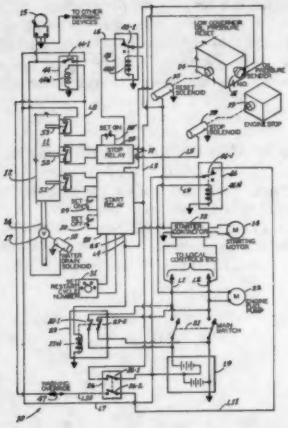
(f) means responsive to the sensed conditions of the starting

motor for opening the valve to effect the supply of the liquid condensate to the engine when the starting motor is in operation and closing the valve to interrupt the supply of the liquid condensate to the engine when the starting motor is at rest.

4,413,595
DIESEL LOCOMOTIVE FUEL SAVINGS AND PROTECTION SYSTEM

John E. Potts, Jr., 4547 Beacon Ct., Decatur, Ill. 62521

Filed May 17, 1982, Ser. No. 378,527
Int. Cl.[3] F02N *17/02;* F02B *77/08*
U.S. Cl. 123—142.5 R 10 Claims



1. A system for automatically protecting, and saving fuel consumed by, an out-of-service diesel engine of a locomotive having a liquid cooling system for said engine and a battery for electrical power supply, said battery being normally electrically disconnected while said engine is out of service, said system comprising

temperature sensing means for sensing the temperature of cooling liquid in said cooling system and for providing a first switching function when the sensed temperature falls to a first preselected value above the freezing point of said cooling liquid, a second switching function when the sensed temperature climbs to a second preselected value higher than said first value, and a third switching function if the sensed temperature falls to a third preselected value lower than said first valve but closer to said freezing point;

first circuit means responsive to said first switching function for electrically reconnecting said battery and for energizing a starter for said engine to initiate operation of said engine for producing increase of said temperature;

second circuit means responsive to said second switching function for energizing a stopping mechanism for said engine to terminate operation thereof;

an audible warning device; and

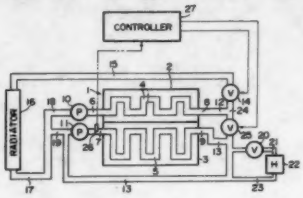
protection circuit means responsive to said third switching function for initiating operation of said warning device;

whereby operation of said engine normally will be automatically effected intermittently to maintain said temperature between said first and second values but said warning device will be operated if operation of said engine is not automatically initiated.

4,413,596
ENGINE COOLING SYSTEM WITH OPTIONALLY COMMUNICABLE HEAD COOLING CIRCUIT AND BLOCK COOLING CIRCUIT, AND METHOD OF OPERATING THE SAME

Tsutomu Hirayama, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Continuation-in-part of Ser. No. 264,866, May 18, 1981, Pat. No. 4,369,738. This application Aug. 26, 1982, Ser. No. 411,804
Claims priority, application Japan, May 21, 1980, 55-68036
Int. Cl.[3] F01P *3/02, 7/16*
U.S. Cl. 123—41.1 26 Claims



1. For an internal combustion engine comprising:

(a) a cylinder head formed with a head cooling jacket for cooling said cylinder head, said head cooling jacket being formed with a cylinder head inlet and a cylinder head outlet;

(b) a cylinder block formed with a block cooling jacket for cooling said cylinder block, said block cooling jacket being formed with a cylinder block inlet and a cylinder block outlet; and

(c) a radiator formed with an inlet and an outlet;

a cooling system, comprising:

(d) a first pump for impelling cooling fluid through said head cooling jacket from said cylinder head inlet towards said cylinder head outlet;

(e) a second pump for impelling cooling fluid through said block cooling jacket from said cylinder block inlet towards said cylinder block outlet;

(f) a block input fluid temperature sensor for sensing the temperature of the cooling fluid which passes out through said cylinder block inlet to said block cooling jacket, and for generating a sensed block input temperature signal representative of said temperature;

(g) a block recirculation conduit system leading from said cylinder block outlet of said block cooling jacket so as to supply flow of cooling fluid, from a downstream part of said block recirculation conduit system, to said cylinder block inlet of said block cooling jacket;

(h) a main recirculation conduit system, an upstream part of which is communicated to said cylinder head outlet of said head cooling jacket, and a downstream part of which is communicated to said inlet of said radiator;

(i) a radiator output conduit system, leading from said outlet of said radiator both to said cylinder head inlet of said head cooling jacket and also to said cylinder block inlet of said block cooling jacket, said downstream part of said block recirculation conduit system being thereby communicated also to said cylinder head inlet of said head cooling jacket;

(j) a first control valve for controlling flow of cooling fluid through said radiator according to a radiator flow regulation signal;

(k) a flow mixing conduit which communicates a part of said main recirculation conduit system with a part of said block recirculation conduit system;

(l) a second control valve for controlling flow of cooling fluid through said flow mixing conduit according to a block flow regulation signal;

and

(m) a controller, which receives said sensed block input temperature signal from said block input fluid temperature

sensor, and which produces, based thereon, said radiator flow regulation signal which is sent to said first control valve, and also said block flow regulation signal which is sent to said second control valve;

(n) whereby said controller can vary the amount of cooling operation provided for said internal combustion engine, by varying the opening amount of said first control valve, thus varying the amount of cooling fluid passing through said radiator; and can also vary the amount of mixing between the cooling circuit for said cylinder head and the cooling circuit for said cylinder block, by varying the opening amount of said second control valve, thus varying the amount of cooling fluid passing through said flow mixing conduit.

17. A method for operating a cooling system of an internal combustion engine having:

(a) a cylinder head formed with a head cooling jacket for cooling said cylinder head, said head cooling jacket being formed with a cylinder head inlet and a cylinder head outlet;

(b) a cylinder block formed with a block cooling jacket for cooling said cylinder block, said block cooling jacket being formed with a cylinder block inlet and a cylinder block outlet; and

(c) a radiator formed with an inlet and an outlet;

said cooling system, comprising:

(d) a first pump for impelling cooling fluid through said head cooling jacket from said cylinder head inlet towards said cylinder head outlet;

(e) a second pump for impelling cooling fluid through said block cooling jacket from said cylinder block inlet towards said cylinder block outlet;

(f) a block input fluid temperature sensor for sensing the temperature of the cooling fluid which passes out through said cylinder block inlet to said block cooling jacket, and for generating a sensed block input temperature signal representative of said temperature;

(g) a block recirculation conduit system leading from said cylinder block outlet of said block cooling jacket so as to supply flow of cooling fluid, from a downstream part of said block recirculation conduit system, to said cylinder block inlet of said block cooling jacket;

(h) a main recirculation conduit system, an upstream part of which is communicated to said cylinder head outlet of said head cooling jacket, and a downstream part of which is communicated to said inlet of said radiator;

(i) a radiator output conduit system, leading from said outlet of said radiator both to said cylinder head inlet of said head cooling jacket and also to said cylinder block inlet of said block cooling jacket, said downstream part of said block recirculation conduit system being thereby communicated also to said cylinder head inlet of said head cooling jacket;

(j) a first control valve for controlling flow of cooling fluid through said radiator according to a radiator flow regulation signal;

(k) a flow mixing conduit which communicates a part of said main recirculation conduit system with a part of said block recirculation conduit system;

(l) a second control valve for controlling flow of cooling fluid through said flow mixing conduit according to a block flow regulation signal;

and

(m) a controller, which receives said sensed block input temperature signal from said block input fluid temperature sensor, and which produces, based thereon, said radiator flow regulation signal which is sent to said first control valve, and also said block flow regulation signal which is sent to said second control valve;

(n) whereby said controller can vary the amount of cooling operation provided for said internal combustion engine, by varying the opening amount of said first control valve, thus varying the amount of cooling fluid passing through said radiator; and can also vary the amount of mixing between the cooling circuit for said cylinder head and the cooling circuit for said cylinder block, by varying the opening amount of said second control valve, thus varying the amount of cooling fluid passing through said flow mixing conduit;

said cooling system being filled with cooling fluid;

said method comprising the processes, simultaneously performed, of:

(o) operating said first pump and said second pump;

and

(p) depending upon said sensed block output temperature signal from said block output fluid temperature sensor, performing either one or the other but not both of the following two processes (q) and (r):

(q) if said sensed block output temperature signal from said block output fluid temperature sensor indicates a cooling fluid temperature at said cylinder block outlet of said block cooling jacket of less than a certain first predetermined temperature value, then simultaneously:

(q1) controlling said first control valve, by said radiator flow regulation signal from said controller, so as substantially to interrupt flow of cooling fluid through said radiator; and

(q2) controlling said second control valve, by said block flow regulation signal, so as to allow a flow of cooling fluid through said flow mixing conduit;

(r) if said sensed block output temperature signal from said block output fluid temperature sensor indicates a cooling fluid temperature at said cylinder block outlet of said block cooling jacket of greater than said first predetermined temperature value, then simultaneously:

(r1) controlling said first control valve, by said radiator flow regulation signal from said controller, so as to allow cooling fluid to flow through said radiator; and

(r2) controlling said second control valve, by said block flow regulation signal, so as to allow a controlled flow of cooling fluid through said flow mixing conduit;

(s) whereby, during the warming up process of said internal combustion engine, before the cooling fluid which passes out through said cylinder block outlet of said block cooling jacket has attained said first predetermined temperature, the cooling systems for said cylinder head and for said cylinder block are substantially communicated, and no substantial cooling is provided for either by said radiator, so that the heat which is supplied to the cooling fluid within the head cooling jacket is communicated to the cooling fluid within the block cooling jacket, and both the cylinder head and the cylinder block are quickly warmed up together; but, after said cooling fluid which passes out through said cylinder block outlet of said block cooling jacket has attained said first predetermined temperature, then according to process (r1) substantial cooling is provided for the cooling fluid in said head cooling jacket, while according to process (r2) the amount of cooling provided for the cooling fluid in said block cooling jacket is regulated; whereby, after said internal combustion engine has been warmed up, said cylinder block may be kept substantially warmer than said cylinder head.

4,413,597

OIL COOLED INTERNAL COMBUSTION ENGINE

John H. Stang, and Steven N. Cusick, both of Columbus, Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed May 13, 1980, Ser. No. 149,332

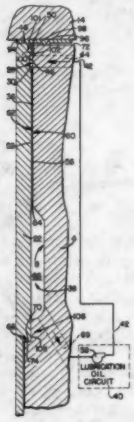
Int. Cl.³ F01P *3/02*

U.S. Cl. 123—41.42 **12 Claims**

2. An oil cooled cylinder liner for use in an internal combustion engine containing a cylinder bore extending inwardly from a surface for engaging an engine head toward a crankshaft to which is connected a piston for reciprocating travel within the cylinder bore and having a radially oriented liner support surface positioned inwardly from the head engaging surface and further having a lubrication oil circuit including an

oil inlet for supplying oil to an exterior surface of the cylinder liner at a point axially adjacent the head engaging surface and still further having a cylinderical outside flow control surface formed on the interior of the cylinder bore having a fixed radius starting adjacent the oil inlet and extending inwardly, said cylinder liner comprising:

(a) a generally hollow cylindrical body having an interior cylindrical surface for guiding the piston during reciprocating movement and having an exterior surface one portion of which includes an oil flow passage forming means for cooperating with the outside flow control surface when the cylinder liner is mounted within the cylinder bore for forming a circumferential flow passage through which a very thin film of lubrication oil of uniform radial thickness may pass under laminar flow conditions having no circumferential component and having a linear component in a direction parallel to the central axis of said hollow cylindrical body and extending inwardly from the oil inlet when the liner is mounted within the cylinder bore, said oil flow passage forming means including an inside flow control surface having a fixed radius along its entire



length which is 0.006 to 0.016 inches less than the radius of the outside flow control surface; and

(b) liner positioning means for positioning said inside flow control surface concentrically within the outside flow control surface when said hollow cylindrical body is positioned within the cylinder bore to form the oil flow passage between said inside flow control surface and the outside flow control surface with a constant radial dimension between 0.006 and 0.016 inches throughout the axial and circumferential extent of the oil flow passage, said liner positioning means including:

(1) outer locating means adjacent the outer end of said hollow cylindrical body for forming a precise radial fit with the outermost portion of the cylinder bore, said outer locating means including a radial flange positioned outwardly from said inside flow control surface, and

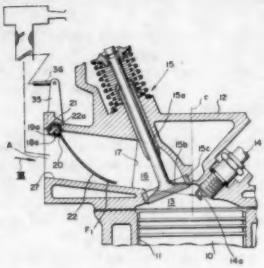
(2) inner locating means positioned inwardly from said inside flow control surface for forming a precise radial fit with a corresponding portion of the cylinder bore when the cylinder liner is mounted within the cylinder bore.

4,413,598

INTAKE CONTROL DEVICE FOR AUTOMOTIVE INTERNAL COMBUSTION ENGINE

Saburo Tsutsumi, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Kanagawa, Japan

Filed Feb. 11, 1981, Ser. No. 233,652
Claims priority, application Japan, Feb. 12, 1980, 55-14801
Int. Cl.³ F02B *31/00*
U.S. Cl. 123—306 **7 Claims**



2. An internal combustion engine comprising;

a cylinder having a longitudinal axis and a piston slidably movable within said cylinder to define a variable volume combustion chamber;

an induction passage leading from said combustion chamber to the ambient atmosphere, said induction passage being oriented with respect to said cylinder so as to introduce a fluid charge transmitted therethrough into said combustion chamber tangentially with respect to the cylinder wall so that the charge enters said combustion chamber and swirls about said cylinder axis;

a single throttle valve disposed within the induction passage for controlling the flow of fluid therethrough;

an intake valve having a stem for controlling fluid communication between the induction passage and said combustion chamber;

a partition disposed in said induction passage for dividing said passage into first and second substantially rectangular cross-section sub-passages, said partition being oriented so that a surface thereof defining part of said first sub-passage is longitudinally aligned with a surface of said intake valve stem so that fluid flowing through said first sub-passage is prevented from impinging upon said valve stem;

a first substantially rectangular guide vane disposed in said first sub-passage;

a second substantially rectangular guide vane disposed in said second sub-passage;

said first and second guide vanes defining first and second variable cross section openings in said first and second sub-passages respectively, said first and second variable cross section openings each having an essentially rectangular cross section being elongate in a direction parallel with a plane normal to said cylinder axis so that the flow component in said plane normal to said cylinder axis is maximized; and

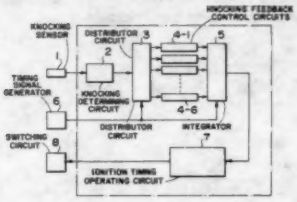
control means interconnecting said throttle valve with said first and second vanes, said control means including a common shaft carrying said first and second vanes and a lost motion arrangement enabling said second vane to remain closed until said first vane has opened by a predetermined amount whereafter said first and second vanes are moved synchronously.

4,413,599

IGNITION TIMING CONTROL SYSTEM IN A SPARK IGNITION TYPE INTERNAL COMBUSTION ENGINE

Takashi Shigematsu; Tomoyuki Watanabe, and Daisaku Sawada, all of Shizuoka, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jan. 7, 1981, Ser. No. 223,082
Claims priority, application Japan, Jan. 7, 1980, 55-000398
Int. Cl.³ F02P 5/14
U.S. Cl. 123—425 6 Claims



1. An ignition timing control system in a spark ignition type internal combustion engine having multiple cylinders, comprising:

at least one knocking detecting means for detecting engine vibrations and emitting a vibration signal;

a knocking determining means for comparing the level of said vibration signal with a reference level and emitting a knocking signal when the level of said vibration signal exceeds said reference level;

a timing signal generating means for emitting a timing signal having one pulse at each predetermined crank angle;

a knocking feedback control means in which knocking feedback control circuits equal in number to cylinders of the engine are arranged in parallel to one another, for operating a correction ignition advance angle in response to said knocking signal and emitting a correction ignition signal;

a distributor means for selecting one knocking feedback control circuit of said knocking feedback control means in accordance with the number of pulses of said timing signal and supplying said knocking signal to the knocking feedback control circuit thus selected, said distributor means comprising a counter provided with output terminals equal in number to the cylinders of the engine and supplied to an input terminal thereof with said timing signal for successively emitting control signals from the output terminals between two pulses of said timing signal, analog switches having respective input and output terminals equal in number to the cylinders of the engine and connected in parallel to said knocking determining means in such a manner that said knocking signal is supplied to the respective input terminals with said analog switches adapted to be successively turned on by said control signals, and delaying circuits equal in number to the cylinders of the engine and connected to the output terminals of said analog switches, respectively, for delaying the knocking signal, which has pressed through said analog switch, for a predetermined period of time and supplying said knocking signal to each of said knocking feedback control circuits;

an integrator means for selecting one knocking feedback control circuit of said knocking feedback control means in accordance with the number of pulses of said timing signal and allowing said correction ignition signal of the knocking feedback control circuit thus selected to pass therethrough;

an ignition timing operating means for operating an actual ignition timing in accordance with said correction ignition signal thus passed through said integrator means and a basic ignition timing; and

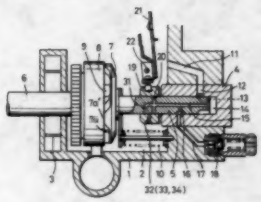
a switching means for controlling an ignition timing in response to an output signal from said ignition timing operating means.

4,413,600

DISTRIBUTOR TYPE FUEL INJECTION PUMP ADAPTED FOR PARTIAL CYLINDER OPERATION OF AN INTERNAL COMBUSTION ENGINE

Hajime Yanagawa, and Yoshio Suzuki, both of Higashi-Matsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Apr. 12, 1982, Ser. No. 367,682
Claims priority, application Japan, Apr. 18, 1981, 56-55934[U]
Int. Cl.³ F02M 59/24; F02D 13/06
U.S. Cl. 123—449 5 Claims



1. In a distributor type fuel injection pump for combination with an internal combustion engine having a plurality of cylinders, said pump including: a plunger having an outer peripheral surface; a plunger housing having an inner peripheral surface along which said plunger is received therein and defining therein a pump working chamber in cooperation with a head portion of said plunger; means for causing simultaneous reciprocating and rotative motion of said plunger; a low pressure space in which a portion of said plunger is located; a first port formed in said plunger in communication with said pump working chamber and opening in a portion of said outer peripheral surface of said plunger located in said low pressure space; a second port formed in said plunger in communication with said pump working chamber and opening in another portion of said outer peripheral surface of said plunger located within said plunger housing; a plurality of outlet pressure channels corresponding in number to said cylinders of said engine and connected to respective injection nozzles, said second port being disposed for successive engagement with said outlet pressure channels during said simultaneous reciprocating and rotary motion of said plunger; and a fuel injection quantity setting member having an inner peripheral surface slidably fitted on said portion of said outer peripheral surface of said plunger located in said low pressure space for engagement with said first port, and controllable in axial position relative to said plunger; whereby pressure feeding of fuel caused by movement of said plunger through a delivery stroke thereof is terminated upon disengagement of said first port from said fuel injection quantity setting member; the improvement comprising: a third port formed in said plunger in communication with said pump working chamber, said third port opening in a portion of said outer peripheral surface of said plunger which is in permanent slidable engagement with said fuel injection quantity setting member; and a plurality of fourth ports formed in said fuel injection quantity setting member in circumferentially spaced relation and smaller in number to said outlet pressure channels, said fourth ports each communicating at one end with said low pressure space and opening at the other end in said inner peripheral surface of said fuel injection quantity setting member at a predetermined axial location thereof; wherein said third port and said fourth ports are arranged relative to each other such that each time said second port engages a predetermined one of said outlet pressure channels, said third port engages a corresponding one of said fourth

ports, during each delivery stroke of said plunger in a predetermined low load region of said engine.

4,413,601

METHOD FOR COMPUTING A COMPENSATION VALUE FOR AN ENGINE HAVING ELECTRONIC FUEL INJECTION CONTROL

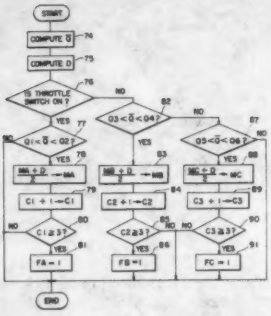
Hiroki Matsuoka; Yukio Kinugasa, both of Susono, and Takehisa Yaegashi, Mishima, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 30, 1981, Ser. No. 326,074

Claims priority, application Japan, Jul. 9, 1981, 56-106255

Int. Cl.³ F02B *3/00, 33/00*

U.S. Cl. 123—480 **20 Claims**



1. A compensation value computing method for an electronic fuel injection controlled engine for controlling the fuel supply to an intake system by operating a fuel injection valve according to electric signals, said method comprising the steps of:

measuring an operating parameter of the engine;

detecting idling, low-load and high-load running conditions of the engine;

storing the measured operating parameter according to the detected running condition in one of first, second and third memory locations being provided corresponding, respectively, to said running conditions of the engine;

calculating a feedback air-fuel ratio on the basis of feedback signals from an air-fuel ratio sensor;

compensating the value in the memory location corresponding to the detected running condition of the engine on the basis of deviation of the feedback air-fuel ratio from a base air-fuel ratio;

adjusting an altimetric compensation value when values in at least two memory locations differ from a base value by not less than a predetermined value; and

adjusting an output compensation value of an air flow meter for detecting intake air flow when the difference between values in the first and third memory locations are larger than that between values in the second and third memory locations.

4,413,602

FUEL INJECTION CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINE

Kazuo Inoue, Tokyo; Ryo Narisawa, Higashikurume; Ryuji Wada, Shiki; Toshihiko Sato, Oi, and Hiroshi Irino, Fujimi, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 9, 1981, Ser. No. 300,542

Claims priority, application Japan, Sep. 16, 1980, 55/127127

Int. Cl.³ G02D *5/00*

U.S. Cl. 123—486 **4 Claims**

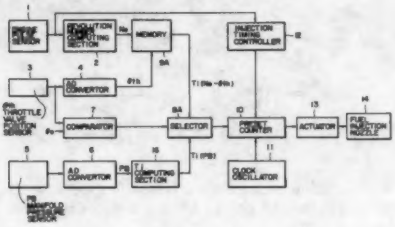
1. An internal combustion engine fuel injection control apparatus comprising:

an injection nozzle for supplying fuel to the engine by injection,

means for detecting the engine revolution number, throttle valve position, and manifold pressure of the engine,

comparator means for comparing the detected manifold pressure with a preset value of manifold pressure, said comparator means being operative to provide an output indicative of whether said detected manifold pressure is above or below said preset value,

memory means for storing a basic fuel injection signal for heavy load, said memory means being addressed by the said engine revolution number and throttle valve position to provide said basic fuel injection signal,



computer means for calculating a basic fuel injection signal for light load as a function of manifold pressure only,

a selector responsive to the output of said comparator means for selecting the basic fuel injection signal provided by said computer means for light load when the engine is operating with a light load, and for selecting the basic fuel injection signal provided by said memory means for heavy load when the engine is operating with a heavy load, and

means responsive to the selected basic fuel injection signal for enabling the injection nozzle to supply fuel to the engine by injection.

4,413,603

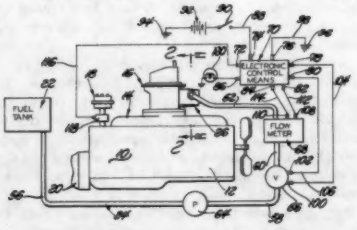
APPARATUS AND METHOD FOR PREVENTING THE SPILLAGE OF FUEL FROM A FUEL RESERVOIR AND THE LIKE

Marion L. Smitley, Birmingham, Mich., assignor to Colt Industries Operating Corp, New York, N.Y.

Filed Dec. 21, 1981, Ser. No. 332,485

Int. Cl.³ F02M *39/00*

U.S. Cl. 123—510 **26 Claims**



1. Apparatus for preventing the flooding of a fuel reservoir associated with a fuel metering system supplying metered fuel to an associated combustion engine, said apparatus comprising fuel supply conduit means for supplying fuel to said fuel reservoir, normally open valve means in fluid circuit with said fuel supply conduit means, and additional means responsive to the rate of fuel flow through said fuel supply conduit means and to the speed of said engine, said additional means being effective

upon the occurrence of an abnormal condition to cause said normally open valve means to become closed, said abnormal condition occurring when said additional means senses that the numerical value of the ratio of the rate of fuel flow actually being supplied through said fuel supply conduit means divided by the then speed of said engine exceeds a preselected numerical value.

4,413,604

FUEL BLENDING INSTALLATION

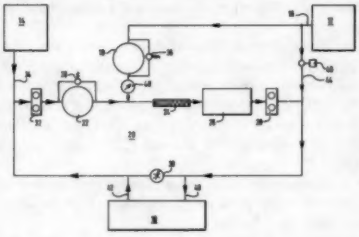
Herbert E. Tune, Epping, England, assignor to Star Engineering Applications Limited, Liverpool, England

Filed Sep. 30, 1981, Ser. No. 307,151

Claims priority, application United Kingdom, Oct. 13, 1980, 8032986

Int. Cl.³ F02M *37/04*; F02B *7/02*

U.S. Cl. 123—515 **13 Claims**



1. A blending installation to supply fuel to an engine comprising:

a closed-loop recirculation circuit for recirculating fuel and including a circulation pump in said loop for recirculating and mixing the fuel in said recirculation circuit totally independent of the operating state of said engine;

a first source of fuel;

a metering pump for delivering fuel from said first source to said recirculation circuit at a predetermined rate;

a second source of fuel and delivery means for delivering fuel from said second source of fuel to said recirculation circuit at a variable rate which is dependent upon the operating state of the engine;

said engine being separated from said recirculation circuit and having inlet means coupled to receive fuel from a first location along said recirculation circuit and having outlet means coupled to return unused fuel to said recirculation circuit at a second location along said recirculation circuit.

4,413,605

INTAKE MANIFOLD HEATING AND EXHAUST GAS RECIRCULATION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Aldo Leoni, Cavoretto, Italy, assignor to Fiat Auto S.p.A., Turin, Italy

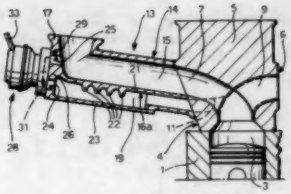
Filed Aug. 25, 1981, Ser. No. 295,973

Claims priority, application Italy, Sep. 12, 1980, 53504/80[U]

Int. Cl.³ F02M *31/00*; F02B *47/08*

U.S. Cl. 123—547 **1 Claim**

1. An internal combustion engine including an engine block defining a plurality of in-line cylinders each having an inlet and outlet duct in communication therewith, an intake manifold having a body defining a plurality of separate intake conduits in communication with said inlet ducts, said body of said intake manifold further defining a chamber located below said plurality of intake conduits, said body having an internal wall separating the chamber and said plurality of intake conduits and having a plurality of ribs on the surface of said wall facing said chamber, two auxiliary outlet conduits communicating said outlet ducts of two cylinders having an operational phase displacement of 180° with said chamber, an exhaust gas recirculation duct communicating said chamber with said intake



conduits and valve means responsive to the engine load to control the communication between said chamber and said intake conduits.

4,413,606

HEATING DEVICE FOR PREHEATING COMBUSTION AIR FOR AN INTERNAL COMBUSTION ENGINE

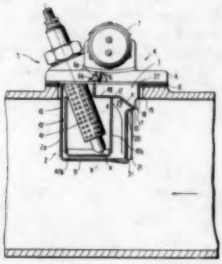
Roland Klak, Ostfildern; Gerhard Fränkle, Remshalden, and Dieter Woschee, Esslingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Oct. 29, 1981, Ser. No. 316,532

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1980, 3040720; Dec. 24, 1980, 3049095

Int. Cl.³ F02M *31/04*; F03D *11/02*

U.S. Cl. 123—550 **29 Claims**



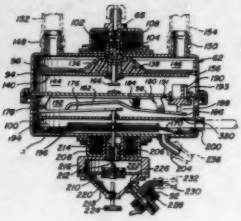
1. A heating means for preheating combustion air flowing through an intake manifold of an internal combustion engine, the heating means including housing means for forming a combustion chamber means, an ignition means projecting into the housing means, a fuel injection nozzle means projecting into the housing means, a valve means for controlling a supply of fuel to the fuel injection nozzle means, and a shield means for shielding a combustion flame from the injection means, characterized in that the housing means is located in a flow path of the combustion air, holder means are provided for covering an open side of the housing means and for supporting and fastening the ignition means, the fuel injection nozzle means, and valve means to the intake manifold, the housing means includes a wall with an upstream wall portion having at least one opening therein, the shield means projects into the housing means in a vicinity of the opening in such a manner so as to separate the combustion chamber means from a fuel injection nozzle chamber means.

4,413,607

PROPANE CARBURETION SYSTEM

William H. Batchelor, 703 S. 11th, Lantana, Fla. 33460, and Douglas R. Batchelor, 4020 Buffalo Rd., Buchanan, Mich. 49107

Continuation-in-part of Ser. No. 177,790, Aug. 13, 1980, Pat. No. 4,369,751. This application Mar. 25, 1981, Ser. No. 247,598
Int. Cl.³ F02B 43/00; F02M 29/00
U.S. Cl. 123—590 22 Claims



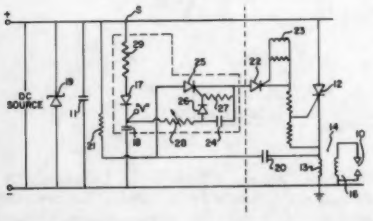
1. A mixer for first and second gases, said mixer including a substantially longitudinally straight venturi duct portion including opposite axial end large cross sectional area inlet and outlet end portions for intaking and discharging one of said gases passing through said venturi duct portion and a smaller cross sectional area midportion including means defining at least a substantially peripherally continuous slot extending about midportion and spaced intermediate said inlet and outlet end portions, and gas supply means for supplying said second gas to said slot for passage therethrough into the interior of said venturi duct portion downstream from the inlet end portion thereof.

4,413,608

ELECTRONIC IGNITION WITH ADVANCE

Bruce R. Beeghly, Youngstown, Ohio, assignor to The Economy Engine Company, Youngstown, Ohio

Filed Nov. 27, 1981, Ser. No. 325,317
Int. Cl.³ F02P 3/06, 500
U.S. Cl. 123—599 14 Claims



1. A trigger circuit comprising:

first, second, and third triggerable switches each being rendered conductive when a signal at its control terminal reaches the threshold level;

said first switch being connected to accept a timing pulse signal;

said first and second switches being connected in series with each other and a control terminal of the third switch to activate the third switch when both the first and second switches have become conductive;

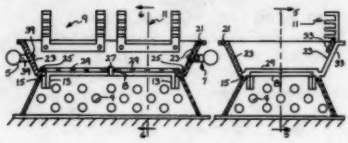
a delay circuit means in series with the first switch and in parallel with the gate and one other terminal of the second switch resulting in a time delay after the first switch is activated by the timing pulse signal before the second switch is activated thus triggering the third switch.

4,413,609

PORTABLE HIBACHI-TYPE CHARCOAL GRILL WITH KINDLING STRUCTURE

Reynold D. Tisdale, 2 Atlantic Ave., Hampton Beach, N.H. 03842

Filed Feb. 15, 1978, Ser. No. 878,164
Int. Cl.³ A47J 37/00
U.S. Cl. 126—25 R 8 Claims



1. A portable Hibachi-type charcoal burning food grill in combination with a structure for kindling the charcoal therein comprising,

(a) an upstanding, shallow dish-like casting which is a container for charcoal having outwardly sloping sides from the bottom to the top thereof, at least one large opening through the bottom and legs extending downward from said bottom for supporting said container on a flat surface with the open bottom thereof spaced above the flat surface,

(b) a grate in the container at the bottom thereof covering the bottom opening which together with the sloping sides contains the charcoal,

(c) a kindling structure having closed sides and readily separable from the dish container below the dish container for supporting the container and which defines an enclosure below the container of relatively larger volume than the shallow container for containing burning kindling material,

(d) the top of the kindling structure snugly fitting the bottom of the container around the grate and around the container legs,

(e) the top and bottom of the kindling structure being open so that the structure forms an upstanding combustion chamber and funnel to the grate and

(f) a multitude of air passages through the sides of the kindling structure providing air flow to kindling materials therein,

(g) whereby kindling material placed in the structure and ignited, burns rapidly to ignite charcoal placed in the container on the grate.

4,413,610

VENTILATED GAS RANGE WITH MODULAR COOKING UNITS

Lee J. Berlik, Cleveland, Tenn., assignor to Raytheon Company, Lexington, Mass.

Filed May 4, 1981, Ser. No. 260,655
Int. Cl.³ F24L 3/00
U.S. Cl. 126—39 K 19 Claims

1. A gas surface range comprising:

a compartment having an orifice hood and a connector rigidly secured therein;

a modular gas burner cartridge removably positioned in said compartment, said cartridge comprising a pan having a burner and igniter rigidly mounted therein;

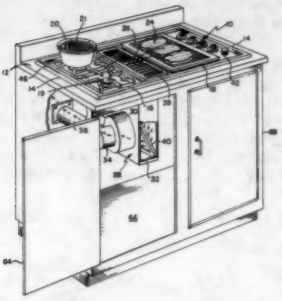
said burner being coupled to said orifice hood;

said igniter being slidably engaged to said connector;

an air duct adjacent to the surface of said range and extending downwardly;

means for providing a down draft through said air duct to ventilate the surface area of said range, said down draft being exhausted through an opening near the bottom of said duct;

means for providing a flow of gaseous fuel to said orifice hood in response to an operator actuable control; and



means for providing a high voltage potential to said connector for activating said igniter.

4,413,611

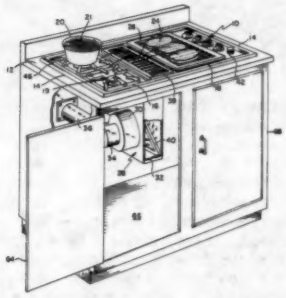
MODULAR GAS RANGE COMPARTMENT

Lee J. Berlik, Cleveland; S. Thomas Barnes, and David E. Levi, both of Chatanooga, all of Tenn., assignors to Raytheon Company, Lexington, Mass.

Filed May 4, 1981, Ser. No. 260,656

Int. Cl.³ F24C *3/00*

U.S. Cl. 126—39 E **9 Claims**



1. An apparatus including a compartment adapted for receiving a detachable modular gas cartridge having a pilotless ignitor and burner, comprising:

an open top burner box;

a partition rigidly mounted in said burner box substantially dividing said box into first and second compartments;

at least one orifice hood rigidly connected to said partition and having its orifice directed into said first compartment;

a gas pipe connected to said orifice hood and routed through said second compartment for supplying gaseous fuel;

a connector rigidly connected to said partition and having a plurality of receptacles each having a terminal secured therein, said receptacles extending into said first compartment;

an operator actuable source of high voltage;

a wire routed through said second compartment coupling said source of high voltage to the terminal of said one of said receptacles;

a cover over said second compartment for enclosing said second compartment; and

said first compartment being open on top and adapted for receiving an interchangeable modular gas cartridge having a pilotless ignitor and burner attached thereto wherein said connector is aligned for detachably coupling with said pilotless ignitor for providing said high voltage to said pilotless ignitor and said orifice hood is aligned for providing said burner with gas.

4,413,612

RED-HOT TYPE OIL BURNER

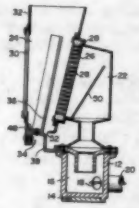
Kazuharu Nakamura; Motoki Matsumoto; Yoshimasa Tsuboi; Akinobu Kondo, and Yoshitaka Kataoka, all of Nagoya, Japan, assignors to Toyotomi Kogyo Co., Ltd., Aichi, Japan

Filed Apr. 16, 1981, Ser. No. 255,001

Claims priority, application Japan, Oct. 17, 1980, 55-148571[U]; Nov. 17, 1980, 55-164352[U]; Dec. 27, 1980, 55-190188[U]; Feb. 3, 1981, 56-14479[U]

Int. Cl.³ F24C *3/02*

U.S. Cl. 126—92 C **17 Claims**



1. A red-hot type oil burner, comprising:

a hollow vaporization means, including a heating element, for vaporizing fuel oil supplied thereto;

mixing means, disposed above and communicated with said vaporization means, for uniformly mixing vaporized fuel oil and air supplied thereto from said vaporization means to provide a combustible mixture;

a combustion chamber disposed adjacent to said mixing means, said combustion chamber comprising a wall including a perforated ceramic plate means for allowing passage of said combustible mixture from said mixing means to said combustion chamber; and

a heat absorption member of heat conductive material, said heat absorption member having one end extended to said combustion chamber and another end, said other end having an open portion through which said vaporization means extends, said open portion being fittedly attached and thermally connected to said vaporization means, said heat absorption member thereby comprising means for evenly conducting a part of the combustion heat to said vaporization means whereby normal combustion is stabilized in said combustion chamber.

4,413,613

SLEEVE DAMPER APPARATUS

David A. Dunlap, Warrenville, Ill., assignor to Jefco Laboratories, Inc., Chicago, Ill.

Filed Jul. 17, 1981, Ser. No. 284,495

Int. Cl.³ F23L *3/00*

U.S. Cl. 126—292 **7 Claims**

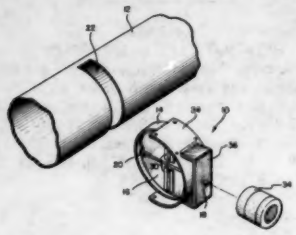
1. A damper device for insertion into a transverse slot provided in an elongated duct transverse to the duct longitudinal axis without cutting completely through said duct, said damper device comprising:

a sleeve having an outer surface conforming to the cross-section of said duct and to the transverse slot in the duct and adapted for insertion through said transverse slot provided in said duct so as to nest within the un-cut portion of said duct;

a damper plate rotatably mounted within said sleeve, including a damper drive shaft extending through said sleeve for

rotating said damper plate from at least one exterior side of said duct;

a cover plate having an aperture for passage of said damper drive shaft therethrough;



said cover plate having a width slightly larger than said transverse slot and adapted to extend over said transverse slot and onto said duct immediately adjacent said transverse slot to reseal said duct; and

means for rigidly mounting said cover plate to said duct.

4,413,614

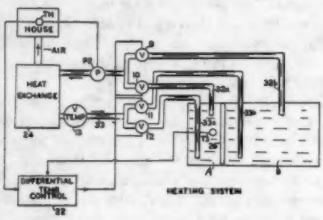
SOLAR HEATING SYSTEM

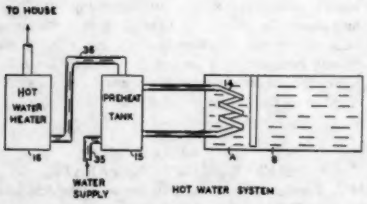
Floyd A. Lyon, Brookville; William H. Yale, and Donald Lyon, both of Locust Valley, all of N.Y., assignors to Halm Instrument Co., Inc., Glen Head, N.Y.

Division of Ser. No. 142,337, Apr. 21, 1980, Pat. No. 4,313,419. This application Oct. 9, 1981, Ser. No. 310,216

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—421 **1 Claim**





1. Solar heating collection system comprising:

a solar collector,

double storage means comprising first and second storage means connected to the collector and the building heating means,

the first storage means of a first fixed size having a capacity for approximately one days operation,

the second storage means of a second fixed size having a capacity for several days operation,

and means connected to control operation of the storage means so that the storage means which is coolest is heated first, and means to control operation of the storage means so that the first storage means is used first and when the first storage means is depleted of usable heat then the second storage means is used, the system having means to heat domestic hot water from the first storage means, means to control collector heat flowing into the first storage means until the correct temperature is obtained, and means operating thereafter to transfer the collector heat into the second storage device.

4,413,615

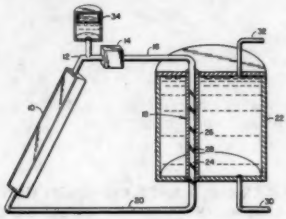
PASSIVE SOLAR ENERGY WATER PREHEAT SYSTEM USING NON-FREEZING HEAT TRANSPORT MEDIUMS

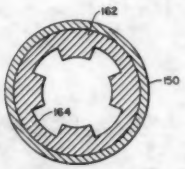
Harry W. Sigworth, Jr., Orinda, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 26, 1981, Ser. No. 267,193

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—434 **9 Claims**





1. A solar energy system for preheating water to a hot water heater, which comprises:

a metal absorber inclined to the horizontal having flow passages therethrough for the thermosiphoning circulation of heat transport fluid at a positive pressure of less than five atmospheres, said fluid being in a normally liquid state over the temperature range, −40° C. to 204° C.;

a conduit loop for the removal of hot transport fluid from the top of the absorber and the return of cool transport fluid to the bottom of the absorber;

expansion chamber means disposed in said conduit for preventing excessive pressure increases in the thermosiphon loop as a result of thermal expansion of the heat transport fluid;

a valve disposed in said conduit having a housing with a lower fluid port for normally receiving fluid from the top of said absorber and an upper fluid port; a valve seat interposed in said housing between said ports;

a valve member movably disposed in said housing above the valve seat, which has a density greater than the fluid at or below the specified normal operating temperature and a density less than the fluid above the specified normal operating temperature, which valve member will sealingly engage the valve seat to prevent the downward flow of fluid if the operating temperature is at or below the specified normal operating temperature, but which will disengage from the valve seat to permit the upward flow of fluid, and which will also disengage from the valve seat to permit the downward flow of fluid if the operating temperature is above the specified normal operating temperature; and

double wall exchanger means in said conduit for transferring heat from said hot transport fluid to a second fluid; and

said valve being disposed in the conduit between the expansion chamber means and the double wall heat exchanger.

3. A solar energy system for preheating water to a hot water heater, which comprises:

a metal absorber inclined to the horizontal having flow passages therethrough for the thermosiphoning circulation of heat transport fluid at a positive pressure of less than five atmospheres, said fluid being in a normally fluid state over the temperature range, −40° C. to 204° C.;

a conduit loop for the removal of hot transport fluid from the top of the absorber and the return of cool transport fluid to the bottom of the absorber;

expansion chamber means disposed in said conduit for preventing excessive pressure increases in the thermosiphon loop as a result of normal expansion of the heat transport fluid;

a valve disposed in said conduit having a housing with an upper fluid port for receiving effluent fluid from the top of said absorber and a lower fluid port; a primary valve seat interposed in said housing between said ports; a secondary valve seat interposed in said housing between said ports below said primary valve seat; a valve member movably disposed in said housing between said primary and said secondary valve seats which has a density less than the fluid at or below the specified normal operating temperature and a density greater than the fluid above the specified normal operating temperature, which valve member will sealingly engage the primary valve seat to prevent the upward flow of fluid if the operating temperature is at or below the specified normal operating temperature, which will disengage from the primary valve seat to permit the downward flow of fluid but which will engage the secondary valve seat to prevent said downward flow of fluid if the operating temperature is above the specified normal operating temperature; and

double wall heat exchanger means in said conduit for transferring heat from said hot transport fluid to water at line pressure.

4,413,616

SOLAR HEAT COLLECTOR ASSEMBLY

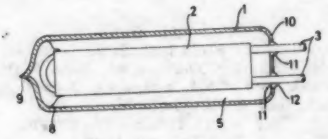
Toshiya Tonomura, Nara; Koichi Takeishi, Sakai; Mitsuhiro Shimada, and Atsuyuki Katto, both of Nara, all of Japan, assignors to Sharp kabushiki Kaisha, Osaka, Japan

Filed Dec. 3, 1980, Ser. No. 212,443

Claims priority, application Japan, Dec. 3, 1979, 54-167869[U]

Int. Cl.³ F23J 3/02

U.S. Cl. 126—443 **3 Claims**



1. A solar heat collector assembly comprising:

a cylindrical transparent glass tube having an open end portion;

a bowl-shaped sealant material bonded to said open end portion of said tube which hermetically seals said open end of said cylindrical transparent tube in a vacuum state, said sealant comprising a material which is the same as said transparent tube material including a heavy metal which raises the softening temperature of said sealant higher than the softening temperature of said tube, said sealant having a coefficient of thermal expansion similar to that of said tube material;

a heat-collecting metallic pipe for transporting a heat-collecting vehicle secured in said transparent tube, said pipe having an end portion which projects outside said open end portion of said transparent tube through said sealant; and

a metallic adhesive material having a coefficient of thermal expansion similar to that of said sealant which bonds said heat-collecting metallic pipe to said sealant.

4,413,617

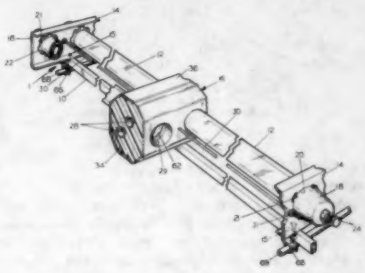
SOLAR COLLECTOR MODULE

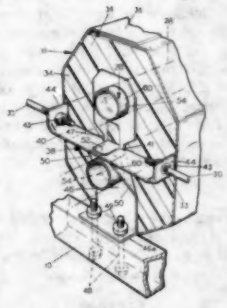
Glenn H. Dunlap, Maumee, and Wayne J. Zitkus, Toledo, both of Ohio, assignors to Sunmaster Corporation, Corning, N.Y.

Filed Mar. 29, 1982, Ser. No. 362,586

Int. Cl.³ F24J 3/02

U.S. Cl. 126—443 **4 Claims**



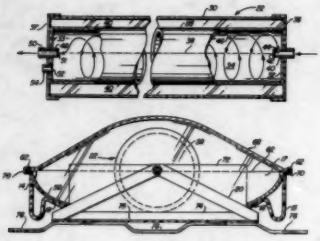


1. A frame for mounting solar collector tubes in a parallel array, the solar collector tubes having fluid inlet and outlet openings in only one end, comprising at least two elongated, parallel girder elements rigidly connected at their one ends by a rigid transverse tube support member, said girder elements being parallel to the desired alignment of the solar collector tubes, a manifold disposed transversely to said longitudinal girder elements, vertical brackets in said manifold secured to said girder elements, inlet and outlet fluid conduits supported by said vertical brackets, means in said manifold for respectively sealingly mounting the open ends of the solar collector tubes in fluid communication with said inlet and outlet conduits, means in said tube support member for supporting the other ends of the solar collector tubes, and a frame rigidifying tie rod disposed in parallel relationship to each girder element, means for securing one end of each said tie rod to said tube support member, means for securing the other end of each tie rod to said vertical bracket, at least one of said securing means being threadably adjustable, thereby permitting a selected degree of tensile stress to be imposed on said tie rods to rigidify the frame during handling and installation.

4,413,618
SOLAR COLLECTOR

Elvin C. Pitts, Irvine; Walter G. Burns, and Harvey R. Anderson, both of Concord, all of Calif., assignors to King Energy Systems, Inc., Irvine and Servamatic Solar Systems, Inc., Concord, both of, Calif.

Filed Nov. 4, 1981, Ser. No. 318,174
Int. Cl.³ F24J 3/02
U.S. Cl. 126—450 16 Claims

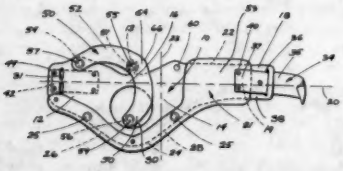


1. A Solar collector comprising:
a collector frame having a longitudinal axis:
reflective means forming a curved reflecting surface for reflecting solar radiation, said reflective means being mounted on the collector frame so that the reflecting surface is substantially symmetric with respect to the longitudinal axis of the frame;
a collector assembly including a right circular cylindrical collector tube having an inner surface, said collector tube having a pair of ends and a longitudinal axis, said collector tube having inlet means and outlet means mounted in opposite ends thereof for introducing into and removing a liquid from the tube, said inlet means directing liquid flowing into the collector tube into a substantially helical path, a right circular cylindrical energy conservator tube made of material which is substantially transparent to the visible spectrum of solar radiation and having an internal diameter greater than the external diameter of the collector tube, and cap means for mounting the conservator tube so that it is substantially concentric with the collector tube; and
means for mounting the collector assembly on the collector frame so that the longitudinal axis of the collector frame substantially coincides with the axis of the collector tube.

4,413,619
PORTABLE CERVICAL COLLAR

Geoffrey C. Garth, 334 Colorado Pl., Long Beach, Calif. 90814

Filed Oct. 16, 1981, Ser. No. 311,959
Int. Cl.³ A61F 5/08
U.S. Cl. 128—76 R 10 Claims

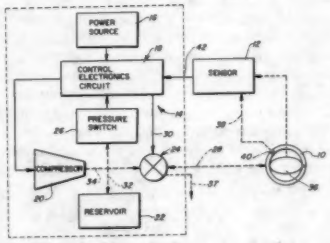


1. A cervical collar formed entirely of a stiff, flexible flat plastic sheet band having an assymetrical configuration comprising:
(a) an elongated neck encircling band formed of said stiff, flexible sheet material having front, side and back portions;
(b) a chin support brace, also formed entirely of stiff flexible plastic sheet material having a generally C-shape including fastening means located on each end of said brace;
(c) said chin support brace fastening means being engageable with cooperative attachment means located at least on opposite sides of said neck encircling band such that when said band is formed into said collar at least one of said fastening means is allowed to align with a respective attachment means thus bowing said brace thereby enabling said brace to obtain an upwardly inclined, conically convex chin rest supported along its' entire length by the upper edge of the front portion of said band and projecting forwardly therefrom;
(d) collar retention means carried at each end of said band and mutually cooperative to retain said band in its collar configuration.

4,413,620
ABDOMINAL RESTRAINT SYSTEM

Samuel M. Tucker, Barrington, Ill., assignor to The Kendall Company, Walpole, Mass.

Filed Sep. 21, 1981, Ser. No. 304,519
Int. Cl.³ A61F 5/37
U.S. Cl. 128—134 21 Claims

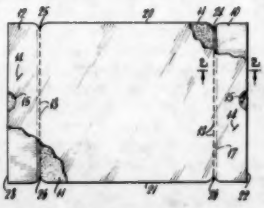


1. An abdominal restraint system, comprising:
means for providing a controlled amount of restraint against movement to a part of the trunk of a patient's body;
means for connection with the patient to detect the onset of a cough or the like by the patient; and
means responsive to said detecting means for controlling the restraint providing means to increase the amount of restraint during the cough or the like.

4,413,621
FILM DRESSING

Robert W. McCracken, Westfield, and James P. Dellas, East Brunswick, both of N.J., assignors to Johnson & Johnson Products, Inc., New Brunswick, N.J.

Filed Dec. 11, 1981, Ser. No. 329,970
Int. Cl.³ A61F 13/02
U.S. Cl. 128—156 4 Claims



1. An adhesive dressing comprising a transparent polymeric film from 0.6 to 10 mils thick having a moisture vapor transmis-

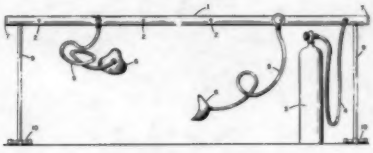
sion rate of at least 15 grams per 100 square inches per 24 hours and being impervious to liquid water, said film having a top edge, a bottom edge and two opposed side edges, a skin-adhering adhesive coating on one side of said film extending from said top edge to said bottom edge and between lines spaced inwardly from said opposed side edges to provide a pair of adhesive-free handling tabs on the side edges of said dressing, a perforation line parallel to each of said side edges and extending through said adhesive coating and said film and a release sheet covering said adhesive coating.

4,413,622

OXYGEN MANIFOLD SYSTEM

Stephen D. Austin, Sandwich, Mass., assignor to AMM Incorporated, Sandwich, Mass.

Filed Dec. 22, 1981, Ser. No. 333,373
Int. Cl.³ A62B 7/00
U.S. Cl. 128—205.25 **12 Claims**



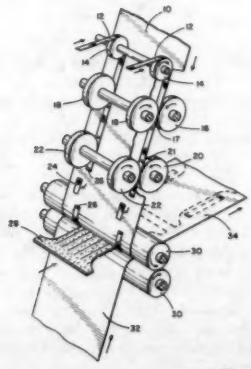
1. A portable medical oxygen delivery system comprising at least one tube having spaced holes along one side of it adapted for the connection of valves thereto; valves connected to said holes; two legs, one extending from the bottom of said tube near each end thereof; the ends of said tube being permanently capped to form an airtight member; one or more of said valves being connectable to one or more portable supplies of oxygen, and at least one of the remaining valves being connected through elongated flexible members to medical oxygen applicators.

4,413,623

LAMINATED STRUCTURES HAVING GATHERED AND UNGATHERED MARGINAL PORTIONS AND METHOD OF MANUFACTURING THE SAME

Heinz A. Pieniak, Chicago, Ill., assignor to Johnson & Johnson Baby Products Company, New Brunswick, N.J.

Filed Feb. 17, 1981, Ser. No. 235,187
Int. Cl.³ A61F 13/16
U.S. Cl. 604—365 **15 Claims**



1. A method for making an elastic structure which can be separated into a series of individual elastic structures comprising:

(a) feeding a web substrate having in the feed direction alternate first portions to be gathered and second portions to remain ungathered;

(b) feeding an elastic member in a stretched condition immediately adjacent to one side of said web substrate;

(c) adhering said elastic member intermittently to said substrate along at least one longitudinal line at the terminating portions of each first portion to be gathered;

(d) severing said elastic member at points adjacent to the adhered portions thereof so as to remove the unadhered portion of the elastic member adjacent to each second portion of the web substrate; and

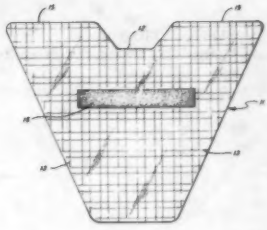
(e) removing the unadhered elastic member portion from the individual elastic structures.

4,413,624

SCROTUM INSULATOR

Paul Snow, 203 London Rd., Apt. 1-24, Concord, N.H. 03301

Filed Jun. 8, 1981, Ser. No. 271,780
Int. Cl.³ A61F 7/00; A61N 00/00
U.S. Cl. 128—399 **6 Claims**



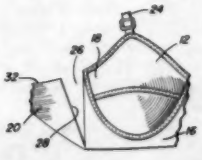
1. As a scrotum insulator, (a) a sheet of flexible insulating material in symmetric trapezoidal form, the base of which is in the range of six to seven inches wide, the top of which is in the range of one and one-half to two and a half inches wide and the height of which is in the range of four and a half to five and a half inches, said base having a centrally located cutout adapted to accomodate the penis, and wherein said sheet is a moisture impervious plastic film having on one side a thin, infrared-reflective metal layer; (b) fastener means attached to the outer face thereof and adapted to secure said insulator to the undershorts of the user.

4,413,625

BRASSIERE CONSTRUCTION

Marvin P. Footer, 2713 Unicorn La., NW., Washington, D.C. 20015

Filed Jan. 26, 1982, Ser. No. 342,888
Int. Cl.³ A41C 3/00, 1/00
U.S. Cl. 128—425 **6 Claims**



1. In a brassiere construction comprising a pair of breast cups, interconnected by a front body portion, a support band connected to the outer edge portions of the breast cups and

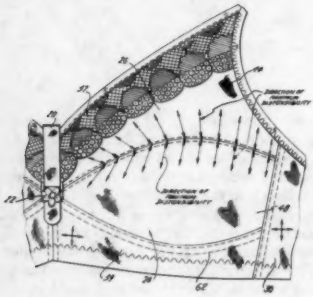
body portion, shoulder straps attached to the upper edge portion of each breast cup and the rear portion of the support band, that improvement comprising the upper edge portion of the support band being shorter than the lower edge portion in a manner that lateral upward and lateral radially inward forces will be exerted on the outer edge portion of the breast cup to pull the outer edge portion of the breast cup radially inwardly toward the chest cavity and upwardly and laterally outwardly thereby providing better fit and more effective support for the outer portion of the breast where the outer tissues thereof connect with the chest area of the wearer.

4,413,626

FOUNDATION GARMENT

Ursula Capasso, Hollis, N.Y., assignor to Exquisite Form Industries, Inc., Pelham Manor, N.Y.

Filed May 22, 1981, Ser. No. 266,168
Int. Cl.³ A41C *3/00*
U.S. Cl. 128—498 **7 Claims**



1. In a brassiere having bust covering and supporting sections and body encircling sections extending from each side of the bust covering section, and means for adjusting the cup size of the bust covering sections, the improvement comprising:

the cup portions each including a lower panel of a material that is distensible substantially in one direction only,

the cup portions each including an upper panel of a material that is distensible substantially in one direction only;

the said upper and lower panels being in engagement with one another along an arcurate line of engagement therebetween, and the alignment of the direction of distensibility of each of said upper and lower panels changing with respect to one another along the said line of engagement;

a body panel of material that is distensible at least around the body of the user;

a means for adjustably gathering and urging downwardly the inner edges of the upper portion of said cup portions; and

wherein the alignment of the directions of distensibility of each of said respective upper and lower panels is 180 degrees at one point along the line of engagement therebetween.

4,413,627

POLAROGRAPHIC CATHETER PROBE

Johannes G. Schindler, Marburg an der Lahn, Fed. Rep. of Germany, assignor to Dr. E. Fresenius Chemisch-pharmazeutische Industrie KG Apparatebau KG, Bad Homburg, Fed. Rep. of Germany

Filed Oct. 3, 1980, Ser. No. 193,599
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1979, 2943457
Int. Cl.³ A61B *5/00*
U.S. Cl. 128—635 **13 Claims**

1. A polarographic catheter-shaped probe for intravenously determining data of fluids, comprising:

a cathode;

an anode;

an electrolyte disposed between said anode and said cathode;

a longitudinally extending flexible catheter sheath having opposed ends, said cathode disposed at one end of said sheath to define a cathode tip, said flexible sheath concentrically surrounding said cathode and said electrolyte and provided with an ion-impermeable but gas-permeable membrane at said cathode tip to seal said electrolyte between said flexible sheath and said cathode, said sheath defining a distal end opposite said cathode tip;

said anode disposed adjacent said distal end of said catheter sheath with the electrolyte extending from said cathode tip to said distal end between said sheath and said cathode; and

a terminal jack located adjacent the distal end of said sheath and electrically coupled to said anode and cathode, said jack adapted for connecting said anode and cathode to measuring instruments.

4,413,628

PH MONITOR ELECTRODE ELECTROLYTE CARTRIDGE

Walter G. Tamulis, 239B Twin Lakes Rd., North Branford, Conn. 06471

Filed Nov. 19, 1980, Ser. No. 208,143
Int. Cl.³ A61B *5/00*
U.S. Cl. 128—635 **4 Claims**

1. A disposable probe tip attachable to an electrode cell to make up a probe assembly used to make a continuous determination of ion concentrations in living tissues wherein the electrode cell has a thin protruding tube and having an ion sensitive membrane on the tip of the tube, the tube having a conductor around the outside thereof but not extending to the membrane, wherein said disposable probe tip comprises:

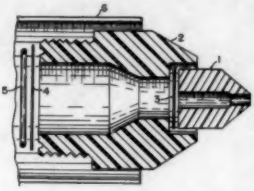
a housing having a hollow chamber therein and having a first and a second opening communicating with said hollow chamber,

an electrolyte solution within the chamber of said housing,

first means sealing said first opening,

second means sealing said second opening and cooperating with said first sealing means to seal said electrolyte within said chamber,

a tip piece with a passage therethrough having a diameter only slightly larger than the diameter of said tube, said tip piece being attached to said housing so as to hold said first



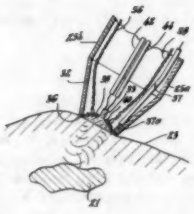
sealing means up against said first opening and so that said first and said second openings are coaxial with the axis of said tip piece passage, the tip of said tube first penetrating said second sealing means, then passing through said electrolyte solution, penetrating said first sealing means and then passing through said passage and exiting therefrom as said disposable probe tip is attached to said electrode cell.

4,413,629

PORTABLE ULTRASONIC DOPPLER SYSTEM

Benton A. Durley, III, Fox Lake, Ill., assignor to Cryomedics, Inc., Bridgeport, Conn.

Filed Apr. 22, 1982, Ser. No. 370,858
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—660 **20 Claims**



1. A portable ultrasonic doppler system for sensing movement comprising:

a handheld unit including a housing with a head end, a transmitting element mounted in said head end, means for energizing said transmitting element to emit ultrasonic energy, a receiving element mounted adjacent said transmitting element in said head end and responsive to ultrasonic energy emitted from said transmitting element and reflected to the receiving element by an object spaced therefrom, means for detecting the response of said receiving element to the reflected ultrasonic energy, radio-frequency transmitter means coupled to said detecting means for transmitting a radio-frequency signal modulated in accordance with the response of said receiving element, and an electrically conductive surface connected to the output of said radio-frequency transmitter means and situated externally of said handheld unit at said head end; and

a radio-frequency receiver unit adapted to receive the radio-frequency signal transmitted from said handheld unit and including audio output means for producing an audible signal in accordance with the response of said receiving element;

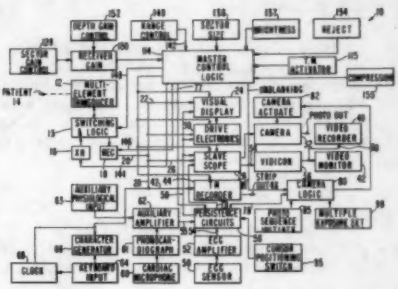
said head end adapted to be placed on the body of a living being in which movement is to be sensed with said transmitting element positioned to emit ultrasonic energy toward a moving object within said body, said receiving element positioned to receive ultrasonic energy reflecting off of said moving object, and said electrically conductive surface in contact with said body, whereby said body serves as the antenna for transmitting said radio-frequency signal to said radio-frequency receiver unit.

4,413,630

SECTOR SCANNER DISPLAY AND RECORDING SYSTEM FOR ULTRASONIC DIAGNOSIS

Weston A. Anderson; Lloyd D. Clark, both of Palo Alto, and William L. Beaver, Los Altos Hills, all of Calif., assignors to Diasonics Cardio/Imaging, Inc., Salt Lake City, Utah

Division of Ser. No. 914,323, Jun. 12, 1978, Pat. No. 4,274,422, which is a continuation of Ser. No. 673,500, Apr. 5, 1976, abandoned. This application Mar. 2, 1981, Ser. No. 239,251
Int. Cl.³ A61B *10/00*
U.S. Cl. 128—661 **17 Claims**



1. An ultrasonic system of the type utilized in patient cardio and cardiovascular diagnosis comprising:

first means including a multi-element transducer for generating and displaying a fan shaped two-dimensional real-time operator-viewable image of a patient region being examined from ultrasonic energy directed into said patient by said transducer and reflected out of said region into said transducer, whereby said two dimensional real-time image is generated by said first means;

ECG recording means operatively associated with said first means, and adapted for connection to said patient being examined, for generating an ECG output from said patient;

means for displaying in real time said ECG output simultaneously with said fan shaped two-dimensional operator viewable image of said patient region being examined on an operator viewable display; and

means responsive to said means for generating said image, for effecting simultaneously with said fan shaped real time two-dimensional image and said ECG output, a TM recording corresponding to a preselected region of said fan shaped real time two-dimensional image viewable during patient examination.

4,413,631

SPHYGMOMANOMETER CONSTRUCTION

Harold G. Lacks, 200 E. 64th St., New York, N.Y. 10021

Filed Dec. 24, 1981, Ser. No. 334,081
Int. Cl.³ A61B *5/02*
U.S. Cl. 128—677 **8 Claims**

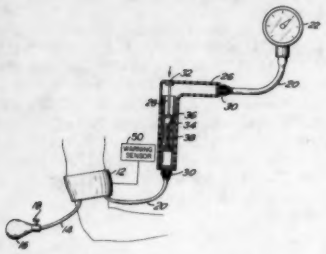
1. A sphygmomanometer construction comprising in combination:

an inflatable cuff adapted to securely encircle a human limb;

a pump means connected to said inflatable cuff via a suitable conduit to affect the inflation thereof;

a manually operated pressure release means connected to said pump means; and

a single pressure gauge for reading systolic and diastolic pressures interconnected to said inflatable cuff via a second suitable conduit having serially interposed in the interconnecting conduit between said pressure gauge and



the point of interconnection with said inflatable cuff a normally closed, manually operated valve for momentarily opening and closing the second conduit thereby affecting the pressurization and subsequent isolation of said pressure gauge, in order to sense and maintain the pressure in said inflatable cuff at the moment of opening and shutting of said valve.

4,413,632

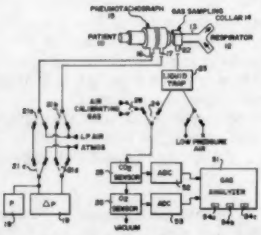
PULMONARY MONITOR

Joseph E. Schlessinger, Berkeley, and Richard G. Hamilton, San Francisco, both of Calif., assignors to Critikon, Inc., Tampa, Fla.

Filed Oct. 9, 1979, Ser. No. 82,898

Int. Cl.³ A61B *5/08*

U.S. Cl. 128—716 **6 Claims**



1. In a system having a conduit carrying respiratory gases, a pulmonary monitor for the measurement, analysis and display of respiratory data characterizing a patient comprising:

(a) first sensing means for measuring respiratory flow in said conduit;

(b) second sensing means for measuring O_2 and CO_2 concentration in said conduit;

(c) an analyzer unit including means responsive to said first and second sensing means for calculating respiratory parameters, and said analyzer unit further comprising:

(1) first selecting means for choosing a mode of operation, each mode having a set of control functions;

(2) second selecting means enabled upon selection of a mode, for selecting a control function for said selected mode of operation; and

(3) manually engaged means for energizing said calculating means for processing said first and second respiratory data into calculated respiratory parameters in response to said first and second selection means.

4,413,633

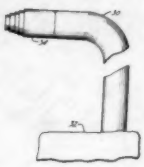
METHOD AND APPARATUS FOR MONITORING BODY CONDITIONS

Roman L. Yanda, 462 Daniels Dr., Beverly Hills, Calif. 90212

Filed Jun. 1, 1981, Ser. No. 269,259

Int. Cl.³ A61B *5/00*

U.S. Cl. 128—736 **8 Claims**



1. Body monitoring apparatus for use with a urinary catheter tube having an outlet opening and a drainage tube having a male connector engageable with the outlet opening of the catheter tube, the apparatus comprising:

a tubular body member having at one end a male connector engageable with the outlet opening of the catheter tube, at the other end an outlet opening engageable with the male connector of the drainage tube, and an exit from the body member between the connector and the outlet opening;

a temperature sensing transducer producing an electrical output, the transducer being located outside the body member;

a flexible transmission line extending from the transducer through the body member from the male connector thereof through the exit to a point outside the body member to transmit the electrical output outside the body member; and

means for sealing the exit.

4,413,634

LOW VOLUME CHANGE DETECTION

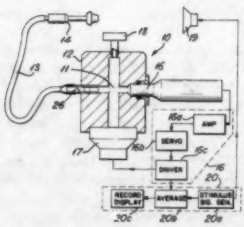
Robert J. Marchbanks, Wallingford, England, assignor to National Research Development Corporation, London, England

Filed Apr. 30, 1981, Ser. No. 259,240

Claims priority, application United Kingdom, May 1, 1980, 8014390

Int. Cl.³ A61B *5/10, 5/12*

U.S. Cl. 128—746 **8 Claims**



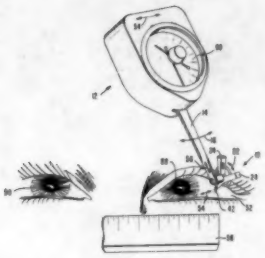
1. Volume change detection apparatus comprising means defining a cavity, said cavity having means for communicating with a variable volume to be measured, a D.C. microphone connected with said cavity for response to fluid pressure changes therein due to variations in the variable volume, an adjustable diaphragm operably connected with said cavity, a servo-control means operably connected between said microphone and said diaphragm to adjust the latter in response to the

output from the former to maintain the pressure in said cavity constant, and output means connected to said servo-control to present a signal representing the diaphragm adjustment.

4,413,635
OPHTHALMIC CLIP

Jon H. Myer, Woodland Hills, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Apr. 7, 1980, Ser. No. 137,682
Int. Cl.³ A61B 5/10
U.S. Cl. 128—782 **14 Claims**

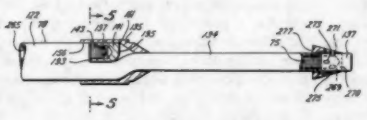


1. Apparatus useful in the correction of strabismus comprising a clip including means attachable to the sclera of an eye without damage thereto for movement of the eye in a desired direction, a force measuring device, and means coupling said device to said clip for enabling said clip to move the eye in only the desired direction and for enabling said device to measure accurately any resistance exerted by anything associated with the eye against the movement.

4,413,636
CATHETER

Martin R. Jasso, Houston, Tex., assignor to Phillip R. Beutel, Colorado Springs, Colo.

Continuation of Ser. No. 95,342, Nov. 19, 1979, abandoned. This application Mar. 25, 1982, Ser. No. 361,802
Int. Cl.³ D61N 1/04
U.S. Cl. 128—786 **8 Claims**



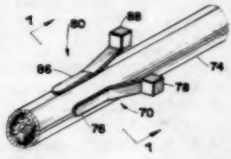
1. An electrode assembly for a catheter having a cathode tip, a first conductor and a second conductor, comprising:

an anode ring having a longitudinal axis, a proximal end and a distal end, and including an outer portion and an inner portion connected to said outer portion, said outer portion including a ring body and said inner portion including an anode insert telescopically received in and frictionally retained in said ring body, one terminal end of such first conductor being disposed entirely within said anode insert, said anode insert including coupling means for mechanically coupling said anode insert of said inner portion to such one terminal end of such first conductor and passing means for passing such second conductor through said anode ring from said proximal end of said anode ring to said distal end of said anode ring, one terminal end of such second conductor being connected to such cathode tip, such cathode tip being spaced distally of said anode ring, said anode insert of said inner portion including a solid member having a proximal end and a distal end, said coupling means including a blind passage extending from said proximal end of said member through a part of the length of said member, such one terminal end of such first conductor being disposed in said blind passage, there being a pair of elongate trapezoidal crimps impressed into said member on opposite sides of said blind passage against such one terminal end of such first conductor, said passing means including a channel extending through said solid member from said proximal end of said member to said distal end of said member, such second conductor being carried within said channel.

4,413,637
DYNAMIC CIRCUMFERENCE GAGE

Christopher Irving, Richmond, Va., assignor to Philip Morris Inc., New York, N.Y.

Continuation-in-part of Ser. No. 226,569, Jan. 19, 1981, abandoned. This application Nov. 6, 1981, Ser. No. 319,009
Int. Cl.³ A24C 5/18
U.S. Cl. 131—84 R **5 Claims**

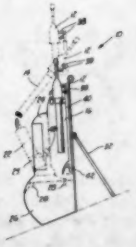


2. A cigarette making apparatus having a garniture for imparting curvature to a garniture tape and thereby to cigarette paper and tobacco disposed on said tape, and short tongue means engageable with said tobacco and cooperative with said garniture for imparting generally cylindrical shape to said tobacco to form a cigarette rod, a folder means for joining a free end of said cigarette paper to said tobacco rod, improvements therein comprising a first and second dynamic circumference gage, said second dynamic circumference gage located at a position approximately 90° around the circumference of said cigarette from said first dynamic circumference gage, said gages comprised of a guide block means, a spring means, and strain gage means mounted on said spring such that said strain gage means exhibits stress changes proportional to changes in said spring flexure due to changes in circumference of said cigarette rod.

4,413,638
SAFETY CIGARETTE BOTTLE

Be V. Le, 912 S. Ter., Wichita, Kans. 67218

Filed Mar. 19, 1982, Ser. No. 359,690
Int. Cl.³ A24F 13/16, 13/22, 13/12, 13/14
U.S. Cl. 131—174 **7 Claims**



1. A safety cigarette bottle for smoking a cigarette or the like, the bottle comprising:

a cigarette holder adapted for holding a cigarette, the holder

pivotally attached to a slide member, the slide member slidably mounted in a cigarette chamber;

a mouth piece with flexible smoking tube connected to the cigarette holder for drawing smoke from the cigarette;

a cigarette lighter hingably mounted in a lighter chamber, the lighter chamber attached to the front of the cigarette chamber, and

an ash tray chamber communicably connected to the bottom of the cigarette chamber, the ash tray chamber releasably attached to the bottom of the cigarette chamber for removing the ashes from the cigarette.

4,413,639

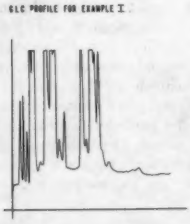
USE OF PRINS AND DERIVATIVES THEREOF IN AUGMENTING OR ENHANCING THE AROMA OR TASTE OF A SMOKING TOBACCO COMPOSITION OR SMOKING TOBACCO ARTICLE COMPONENT

Richard M. Boden, Monmouth Beach, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

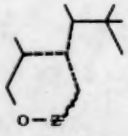
Division of Ser. No. 267,850, May 28, 1981, Pat. No. 4,359,412. This application Jun. 24, 1982, Ser. No. 391,596

Int. Cl.³ A24B *3/12, 15/32, 15/36*

U.S. Cl. 131—276 **1 Claim**



1. A process of augmenting or enhancing the aroma or taste of a smoking tobacco composition or smoking tobacco article component comprising the step of adding to a smoking tobacco composition or at least a portion of a smoking tobacco article, an aroma or taste augmenting or enhancing quantity of at least one compound defined according to the structure:



wherein one of the dashed lines is a carbon-carbon double bond and each of the other of the dashed lines is a carbon-carbon single bond; wherein the wavy line: ~~~ is a carbon-carbon single bond or no bond at all; wherein Z represents hydrogen, $—CH_2—$, or C_2–C_4 acyl; with the proviso that when the wavy line: ~~~ is no bond at all, Z represents hydrogen or C_2–C_4 acyl and when the wavy line: ~~~ is a carbon-carbon single bond, then Z represents $—CH_2—$.

4,413,640

APPARATUS FOR TRANSPORTING ROD-SHAPED ARTICLES OF THE TOBACCO PROCESSING INDUSTRY

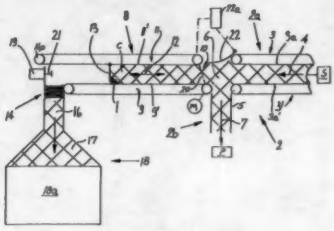
Günter Wahle, Reinbek, and Willy Rudszinat, Dassendorf, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed Jun. 9, 1981, Ser. No. 271,970

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1980, 3021696

Int. Cl.³ A24C *5/32, 5/33;* **A20C** *5/35*

U.S. Cl. 131—281 **35 Claims**



1. Apparatus for transport and temporary storage of rod-shaped articles which are supplied by at least one first variable-output machine and are normally processed by at least one second variable-output machine, comprising a reservoir including wall means defining a chamber having spaced apart first and second openings, said wall means comprising a partition disposed in said chamber and movable between plural first positions intermediate said openings and at least one second position in which said openings communicate with each other; conveyor means defining an elongated path communicating with said first opening and having first and second portions respectively located upstream and downstream of said first opening, said conveyor means including first and second sections respectively arranged to advance rod-shaped articles sideways at first and second variable rates along said first and second portions of said path, said first and second rates being respectively functions of the output and requirements of said first and second machines; and means for moving said partition between said first positions to thereby permit entry of articles into and effect evacuation of articles from said chamber via said first opening when the difference between said first and second rates is within a given range such that said partition assumes one of said first positions, as well as to permit evacuation of articles from said path by way of said first opening, said chamber and said second opening when the difference between said rates is outside of said given range so that the partition assumes said second position.

4,413,641

CIGARETTE MOUTHPIECE

R. William Dwyer, Jr., and Mable L. Fleming, both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 73,394, Sep. 7, 1979, abandoned. This application Jul. 22, 1981, Ser. No. 285,842

Int. Cl.³ A24D *3/00*

U.S. Cl. 131—361 **8 Claims**

1. A filter-tipped cigarette having a cylindrical mouthpiece, said mouthpiece comprising an inlet end attached to the exit

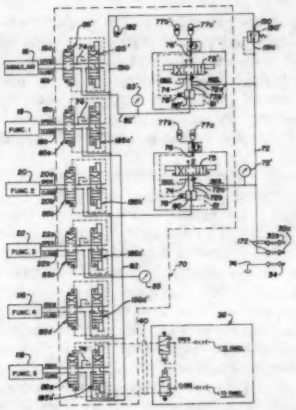
end of the filter, an outlet end opposite said inlet end from which smoke may leave the cigarette by way of at least one orifice therein, said orifice being an annular opening of smaller area in transverse section than the filter and being centered on the longitudinal axis of the filter, and at least one channel connecting said inlet end of the mouthpiece to said orifice, said channel being non-occluded, being of the same area at the inlet end as the filter, and being of the same area at the outlet end as the orifice, said channel continuously decreasing in transverse sectional area from the inlet end to a point between the inlet end and the outlet end and being from said point to the outlet end a substantially cone-shaped passage defined by a cone-shaped baffle with apex at said point, said filter being cylindrical.

4,413,642

BLOWOUT PREVENTER CONTROL SYSTEM

Gary D. Smith, and Richard D. Relyea, both of Spring, Tex., assignors to Ross Hill Controls Corporation, Houston, Tex.

Filed Oct. 17, 1977, Ser. No. 843,010
Int. Cl.³ F16K *31/12*
U.S. Cl. 137—14 **2 Claims**



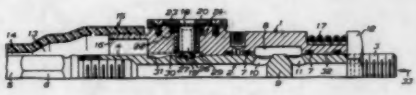
1. A method of regulating pressure of fluid in a regulated pressure line in a blowout preventer control system to which fluid at a higher pressure is supplied from a source of pressurized fluid, the method comprising the steps of: charging a closed system to a set-point pressure at which pressure in the regulated pressure line is to be maintained, said closed system including a pair of accumulators precharged to different pressures, connecting the pair of accumulators through a valve to the source of pressurized fluid, delivering pressurized fluid through the valve into the accumulators to establish the set-point pressure; delivering pressurized fluid to the valve through a first line, diverting flow of fluid from the first line to a second line if the flow rate of fluid in the first line exceeds a predetermined flow rate; sensing the difference between the set-point pressure in the closed system and pressure in the regulated pressure line by applying the set-point pressure of the closed system to a first valve actuator and by applying the regulated pressure of the regulated pressure line to a second valve actuator; and mounting the first and second valve actuators with a regulator valve such that when the pressure in the regulated pressure line is less than the set-point pressure, the regulator valve is actuated to deliver pressurized fluid from the source of pressurized fluid into the regulated pressure line, and such that when the pressure in the regulated pressure line is greater than the set-point pressure, the regulator valve is actuated to remove fluid from the regulated pressure line.

4,413,643

HOSE-BREAK VALVE

Thore K. E. Wiklund, Piteå, Sweden, assignor to Regioninvest i Norr AB, Luleå, Sweden

PCT No. PCT/SE80/00185, § 371 Date Apr. 22, 1981, § 102(e) Date Apr. 22, 1981, PCT Pub. No. WO82/00185, PCT Pub. Date Jan. 21, 1982
PCT Filed Jul. 4, 1980, Ser. No. 261,227
Int. Cl.³ F16K *13/04*
U.S. Cl. 137—68 R **9 Claims**



1. A hose-break valve for pressure hoses or conduits with a surrounding protective hose or conduit and a pressure medium in a space between the pressure and protective hoses or conduits, comprising,

a valve housing,

said valve having a flow passage for communicating with a pressure hose or conduit, and a chamber communicating with the space between the pressure and protective hoses or conduits,

a sliding gate which is movable along said valve housing between an open position and a closed position, said sliding gate when in its open position permitting throughflow through the flow passage and when in its closed position preventing throughflow through the flow passage,

a yieldable loading device for actuating the sliding gate toward its closed position to close the flow passage when the pressure of said pressure medium in said chamber falls short of a lower limit value,

actuating means responsive to and actuated by the pressure of said pressure medium in said chamber for actuating the sliding gate toward its open position against the action of the yieldable loading device, said actuating means being independent of and unresponsive to the pressure in said flow passage,

a pressure relieving device operable to relieve the pressure in the chamber when such pressure exceeds an upper limit value, said yieldable loading device being operable when said pressure is relieved to move the sliding gate to its closed position.

4,413,644

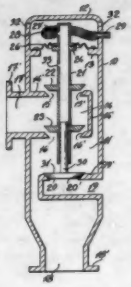
AUTOMATIC VACUUM BLEED VALVE FOR USE ON PAPER MAKING MACHINES

Derrick R. Woodward, Pointe Claire, Canada, assignor to Jwi Ltd., Kanata, Canada

Filed Sep. 10, 1981, Ser. No. 300,951
Int. Cl.³ G05D *16/06*
U.S. Cl. 137—103 **10 Claims**

1. An automatic adjustable vacuum bleed valve comprising a valve body defining a first chamber connected to a vacuum operated device, an opening in said body communicating said first chamber to atmosphere, a second chamber within said body and connectible to a vacuum source, said second chamber being defined by a chamber housing extending within said body, a hollow cylindrical valve stem passing through said chamber housing and having a stem valve secured thereto for seating in a port in a wall of said chamber housing, a further valve positioned concentrically with said valve stem for seating in said opening in said body, said further valve having a stem slidingly engaged in a lower end of said valve stem, an upper end of said cylindrical valve stem being flexibly connected to said valve body by a flexible impervious diaphragm having opposed surfaces, one of said surfaces being exposed to atmosphere and the other of said surfaces being exposed to said

first chamber, means for introducing a controlling flow of fluid into said cylindrical valve stem, and a restricting orifice in said



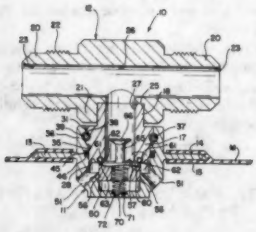
valve stem to restrict the flow of fluid and thereby provide pressure control in said cylindrical valve stem to regulate the vacuum in said first chamber.

4,413,645

FLUID SWIVEL VALVE DEVICE

Peter P. Seabase, Cuyahoga Falls, and Rickard N. Crewes, Uniontown, both of Ohio, assignors to National Machine Company, Inc., Stow, Ohio

Filed Dec. 24, 1980, Ser. No. 219,917
Int. Cl.³ F16K *15/20*
U.S. Cl. 137—223 **7 Claims**



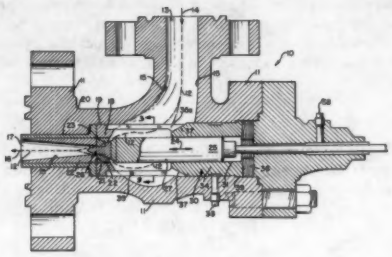
1. In a swivel valve assembly for an inflatable member permitting passage of a high pressure and velocity input of fluid from a pressurized source and providing sealing closure upon pressure equalization, the valve assembly comprising, body means having connecting means for sealing engagement with the inflatable member, cylindrical bore means in said body means communicating with the pressurized source of fluid, cylindrical recess means of greater diameter than and communicating with said bore means, passage means in said body means communicating with the inflatable member and connecting with said cylindrical recess means, and poppet means movable within said bore means and said cylindrical recess means, having a seating surface extending radially outwardly of said bore means to engage a sealing member in said body means for precluding fluid flow upon pressure equalization, and having a disk positioned in said cylindrical bore means for providing preselected throttling of the high velocity input of fluid before passing said sealing member.

4,413,646

STREAMLINE COAL SLURRY LETDOWN VALVE

Robert J. Platt, Dover, and Edward A. Shadbolt, Basking Ridge, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 259,489, May 1, 1981. This application May 14, 1981, Ser. No. 263,750
Int. Cl.³ F16K *1/12, 47/04*
U.S. Cl. 137—240 **9 Claims**



1. A high pressure coal slurry letdown valve, comprising:

means defining a high pressure cylindrical flange valve inlet and a low pressure cylindrical flange valve outlet, said outlet including a stepped cylindrical bore including an internal recess for slidably receiving and locating a valve seat means and wherein the central axis of said inlet and said outlet are disposed at generally right angles to one another;

means defining a streamlined arcuate coal slurry flow path disposed between said inlet and said outlet;

two-piece valve seat means defining a valve throat, said seat means including a first member having a downstream divergent flow path and adapted to slidably seat within said bore against said internal recess and having a flat upstream end surface transverse to said flow path, and a second member separate from said first member slidably fitted in said bore in abutting end contact with the flat end portion of said first member defining a convergent upstream portion of said seat means;

a biased cage including at least two pillars fixedly disposed within said flow path opposite said inlet, said cage having at least two truncated conical surface portions between said pillars adjacent said valve inlet to provide streamlined surfaces generally conforming to the streamlined arcuate flow path means between said inlet and said outlet, said cage having an end portion in contact with said seat means second member to hold said seat means in said recess; and

a plug movably disposed within and slidably supported by said biased cage for controlling flow of coal slurry through said valve throat.

4,413,647

LEAK DETECTION ARRANGEMENT FOR VALVE HAVING SEALING MEANS

Bruce L. De Lorenzo, and Daniel J. McCarthy, both of P.O. Box 72, Clifton, N.J. 07015

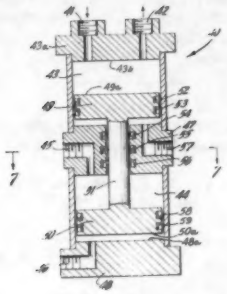
Continuation of Ser. No. 309,903, Nov. 27, 1972, abandoned, and Ser. No. 624,199, Oct. 20, 1975, Pat. No. 4,052,997, and Ser. No. 839,096, Oct. 3, 1977, abandoned. This application Jul. 9, 1979, Ser. No. 55,722
Int. Cl.³ F16L *55/07*
U.S. Cl. 137—312 **3 Claims**

1. Valve construction comprising actuating means and a chambered valve body including

a first chamber in the valve body having a fluid inlet passage and a fluid discharge passage,

a valve wall portion between the inlet and discharge passages of the first chamber,

a first plunger movable toward and away from the valve wall portion of the first chamber,
an end wall portion for the first chamber on the side of the first plunger remote from the valve wall portion,
a second chamber having opposed fluid inlet and discharge passages and an end wall remote from the first chamber provided with a centrally imperforate wall portion,
a second plunger freely disposed in relation to the end wall provided with the centrally imperforate wall portion and operatively arranged for movement between the opposed passages of the second chamber,
first sealing means mounted between the first plunger and



the first chamber for preventing the flow of fluid from the first chamber into the second chamber,
second sealing means spaced from the first sealing means for preventing the flow of any fluid leaking past the the first sealing means from flowing into the second chamber, and
a separate leak detection passage extending from the interior of the first chamber outwardly to the exterior thereof and located in the end wall portion of the first chamber and between the first and second sealing means and directly openly communicating with the first chamber for the flow of any fluid leaking past the first sealing means to a visible location outside of the valve body to indicate that the first sealing means requires replacement.

4,413,648

HYDRAULIC VALVES

Ronald B. Walters, Wembley, and Anthony G. Hammond, Guildford, both of England, assignors to Sperry Limited, Cobham, England

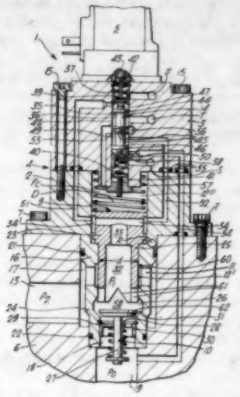
Filed Jul. 24, 1980, Ser. No. 171,894

Claims priority, application United Kingdom, Jul. 26, 1979, 7926162

Int. Cl.³ F16K *31/122, 31/02*

U.S. Cl. 137—486 **4 Claims**

1. A hydraulic control valve comprising
a main valve having a main valve inlet port and a main valve outlet port and incorporating a fluid pressure actuated valve piston located in a matching valve cavity and having first and second ends,
said valve piston cooperating with said main valve outlet port for forming a variable metering orifice to control flow from said inlet port to said outlet port,
said valve piston having at least one end-to-end fluid duct such that both ends of the valve piston are exposed to the pressure at the inlet to the metering orifice,
said valve piston ends having equal areas,
said valve piston comprising a collar defining a first effective control surface area and a second effective control surface area equal to the first effective control surface area,
a pilot stage including a pilot valve and variable flow setting means acting on said pilot valve,
fluid control means through which a controlled proportion of fluid pressure acting in operation of the valve on said second effective control surface area is applied to said first effective control surface area of the valve piston thereby to control the variable metering orifice,
flow sensing means between the inlet port and the outlet port for generating a flow-dependent feedback signal,



and feedback signal transmission means coupled to the flow sensing means and to the pilot stage to transmit the flow-dependent feedback signal to the pilot stage to control the variable flow setting means acting on said pilot valve.

4,413,649

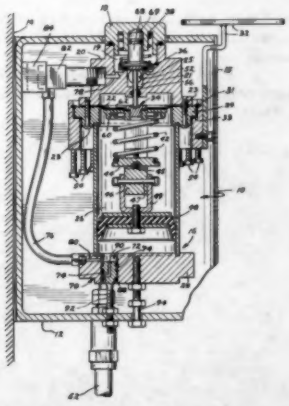
AIR PRESSURE REGULATOR

Charles R. Rodd; Doris M. E. Rodd, both of Rte. 3, Box 59, and Richard L. Scheuerman, 317 E. Chestnut, all of Redwood Falls, Minn. 56283

Filed Mar. 29, 1982, Ser. No. 363,017

Int. Cl.³ F16K *31/12*

U.S. Cl. 137—505.39 **19 Claims**



2. A multi-value air pressure regulator including:
a main body member providing an unregulated first pressure cavity, a regulated second pressure cavity and a valve seat between those cavities;
a diaphragm in sealing relation to said second cavity and spaced from said valve seat;
a first conduit open from a source of air at a maximum pressure to said first cavity;

a second conduit open from the second cavity to a location for use of air at a regulated pressure not greater than said maximum pressure;

a regulator valve operably associated with said diaphragm to move into sealing relation with respect to said valve seat responsive to movement of said diaphragm in a first direction away from said second cavity and to move into clearing relation to said valve seat responsive to movement of said diaphragm in a second direction toward said second cavity;

a pressure regulation spring having a first end in force-transmitting relation to said diaphragm in position to tend to move said diaphragm toward said second cavity;

a spring harness on a second end of said pressure regulation spring;

spring drive means operative on said spring harness to force said pressure regulation spring to tend to move said diaphragm in said second direction;

control means operative selectively to enable and to disable said spring drive means;

a bar operably connected with said spring harness to move in a first direction responsive to movement of the spring harness in a first direction and to move in a second direction responsive to movement of the harness in a second direction under the influence of said spring drive means;

a plurality of bar movement stop means movably mounted with respect to said main body member and positionable to interrupt the movement of the bar in its second direction;

said stop means being serially movable to selectively position any one of said stop means in operative inteferring alignment with said bar; and

each of said stop means being of configuration, when in operative alignment with said bar, to interrupt the bar movement, when said drive means is enabled, at a different operative distance from the valve seat from that of other stop means when so aligned so that the minimum pressure in the second cavity at which the regulator valve first comes into sealing contact with the valve seat can be different for every stop means so aligned.

4,413,650

HYDRAULIC SPOOL VALVES WITH CONTROLLED BY-PASS

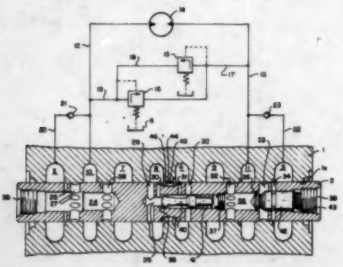
Walter Kropp, Aschaffenburg, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Hollriegelskreuth, Fed. Rep. of Germany

Filed Apr. 24, 1981, Ser. No. 257,148

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1980, 3016533

Int..Cl.³ F15B *13/04*

U.S. Cl. 137—596.13 **3 Claims**



1. A valve for controlling the flow of fluid between a pump, a consumer of hydraulic energy and a reservoir comprising a housing having a bore, a spool slidable in said bore, said spool having a fluid by-pass including at least one restrictor passage therein, a plurality of spaced chambers in said housing surrounding the bore and spool, connections from two of said chambers to opposite sides of consumer of hydraulic energy, a connection from at least a third and fourth one of said plurality of chambers to a pump and a connection from at least a fifth one of said plurality of chambers to a reservoir, said chambers and spool being arranged so that in a first position said two chambers having a connection to the energy consumer are selectively closed and the pump is directly connected to the reservoir through said third and fifth chambers, through said fluid by-pass in the spool, and in a second position of the spool the said fourth chamber connected to the pump is connected to one of said two chambers connected to the energy consumer and in an intermediate position between said first and second position the said third chamber is connected to said reservoir through said at least one restrictor in the spool and through the fifth chamber, said fluid by-pass having an adjustable pressure control valve controlling the flow therethrough and through the restrictor passage.

4,413,651

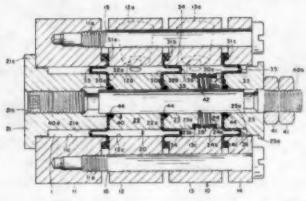
DIAPHRAGM VALVE AND METHOD

Kip B. Goans, Harvey, La., assignor to Baker Cac, Inc., Belle Chasse, La.

Filed Aug. 24, 1981, Ser. No. 295,205

Int. Cl.³ F16K *11/02*

U.S. Cl. 137—625.25 **16 Claims**



1. A fluid pressure valve, comprising: a hollow body; an actuator mounted in the bore of said hollow body for limited axial reciprocating movement relative thereto; an annular chamber defined between the exterior surface of said actuator and the bore of said hollow body; an annular flexible diaphragm; means on said hollow body for sealingly anchoring the outer periphery of said annular diaphragm; means on said actuator for sealingly anchoring the inner periphery of said annular diaphragm, thereby dividing said annular chamber; means for creating a fluid pressure said annular chamber; said diaphragm having an annular re-entrant portion disposed between and concurrently contacting said bore of the hollow body and the exterior surface of said actuator in sealing relation by the pressure force of said fluid pressure differential, said re-entrant portion having at least one aperture therein, each said aperture in said diaphragm being surrounded by an annular ridge of elastomeric material bonded to said diaphragm; said aperture being disposed between said hollow body bore and said actuator relative to said hollow body and being sealingly engaged with one of said hollow body bore and said actuator exterior surface in another axial position of said actuator relative to said hollow body.

4,413,652

GAS-LIQUID ACCUMULATOR

Murry Allewitz, Houston, Tex., assignor to Oil Air Industries, Inc., Houston, Tex.

Filed Mar. 30, 1981, Ser. No. 248,143

Int. Cl.³ F16L *55/04*

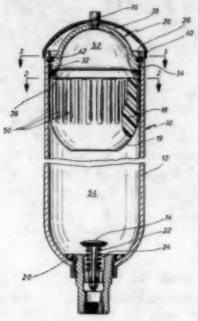
U.S. Cl. 138—31 **7 Claims**

5. In a gas-liquid accumulator having a housing, a spring loaded liquid inlet-outlet valve connected to the bottom of the housing, and a gas charging and release valve for charging and releasing gas from the housing, the improvement in a separator

in the housing for separating the gas and liquid and actuating the liquid valve comprising,

a solid cylindrical buoyant float having a tapered bottom, and

a plurality of axially extending recesses around its outer periphery for preventing the float from sticking on the interior of the housing.



7. In a gas-liquid accumulator having a housing, a spring loaded liquid inlet-outlet valve connected to the bottom of the housing, a gas charging and release valve for charging and releasing gas from the housing, a separator in the housing for separating the gas and liquid and actuating the liquid valve, the improvement in the liquid inlet-outlet valve comprising,

said valve being a poppet valve in which the valve element is enclosed by a resilient coating, and

an annular resilient ring bonded to the coating and positioned to seat on the valve seat.

4,413,653

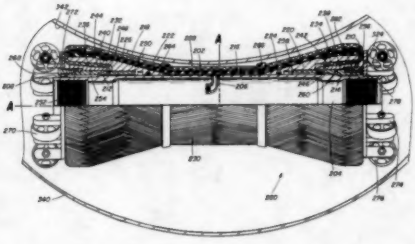
INFLATION ANCHOR

Ernest E. Carter, Jr., Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Oct. 8, 1981, Ser. No. 309,621

Int. Cl.³ F16L *55/12*

U.S. Cl. 138—89 **14 Claims**



1. An inflation anchor adapted for use in a conduit, comprising:

a substantially cylindrical mandrel;

an anchor assembly comprising an anchor and a wedge mounted at each end of said mandrel;

an inflatable elastomeric bladder surrounding said mandrel and each of said anchor assemblies; and

an expandable fabric of substantially tubular configuration surrounding said bladder, said anchor assemblies and said mandrel, each end of said fabric being wrapped around the longitudinally outermost extremity of each anchor, and tucked against an interior surface thereof, being clamped against said anchor by said wedge.

4,413,654

CLEAN OUT DEVICE

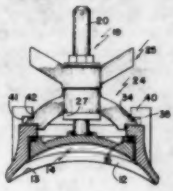
Guenter Jahn, Winnipeg, Canada, assignor to Orifice Industries Ltd., Winnipeg, Canada

Filed Jan. 22, 1982, Ser. No. 341,907

Claims priority, application United Kingdom, Jan. 22, 1981, 8101992

Int. Cl.³ F16L *55/10*

U.S. Cl. 138—92 **38 Claims**



1. A clean out device for use within the wall of pipes, conduits, clean out elbows, tanks, chutes and the like comprising in combination a centrally apertured frame, the peripheral wall of the frame defining the central aperture therein, a detachable cover plate selectively and sealably engageable around the underside part of the wall defining the aperture, for selectively closing said aperture, and a clamping assembly secured to said cover and extending substantially perpendicular from the outer surface thereof, and means on the upper side of said frame cooperating with said clamping assembly to hold said cover in the closed, sealed relationship with said frame, said clamping assembly also including means cooperating with said frame, to move said cover out of sealing engagement with said frame, said clamping assembly including a screw threaded stem secured to and extending upwardly from said cover plate, a cylindrical element screw threadably engaging upon said stem, a clamping member freely engaging the lower part of said cylindrical element and cooperating with said frame, means retaining said clamping member upon said cylindrical element, an actuating member engaging said cylindrical element above said clamping member, said actuating member being operatively secured to said cylindrical element to rotate said cylindrical element upon said stem, and means retaining said actuating member upon said cylindrical element.

4,413,655

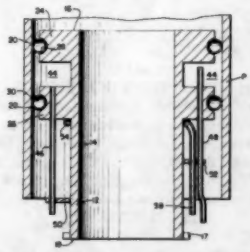
PIPE REPAIR BYPASS SYSTEM

George T. Brown, Box 412, 255 Edge Ave., Valparaiso, Fla. 32580

Filed Apr. 14, 1981, Ser. No. 253,906

Int. Cl.³ F16L *55/12, 55/18*

U.S. Cl. 138—97 **8 Claims**



1. A pipe repair bypass device, comprising a tubular housing having a central passageway extending therethrough along a longitudinal axis and opening on opposite ends of said housing;

coupling means, mounted on one end of said housing, for attaching a conduit to said housing in fluid communication with said passageway;

seal means comprising two, annular, expandable seals, mounted on an exterior surface of said housing upstream of the area to be repaired and spaced along said longitudinal axis, for forming a seal between said housing and a pipe in which said housing is mounted, said seal means defining an interstage volume therebetween which is sealed upon expansion of said seal means against the pipe;

means for expanding said seal means in a direction substantially perpendicular to said longitudinal axis; and

purge gas means, located between said seal means and said coupling means, for supplying gas to the pipe interior outside of said housing and downstream of said interstage volume, said seal means being completely located upstream of said purge gas means;

whereby, the device safely relieves the pressure on said seal means by conveying the fluid in the pipe through the conduit, and said purge gas means produces turbulent flow of purge gas.

4,413,656

WRAP-AROUND DEVICE

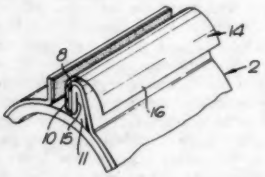
Kenneth B. Pithouse, Wiltshire, England, assignor to Raychem Limited, London, England

Filed Aug. 26, 1981, Ser. No. 296,278

Claims priority, application United Kingdom, Sep. 13, 1980, 8029661

Int. Cl.³ F16L *57/00*

U.S. Cl. 138—110 **12 Claims**



1. A wraparound device for enclosing at least part of an elongate substrate, comprising:

a dimensionally-recoverable cover having an adhesive closure arrangement comprising two closure portions which can be brought into abutment to form an adhesive bond, wherein the adhesive bond is formed by a heat-curable adhesive and after the bond is formed, changes in configuration to form a lap joint by recovery of the cover about the substrate; and

an element of higher thermal conductivity than that of the cover, the element being so arranged that, when the closure portions have been brought together the element extends from an external surface of either of the closure portions so as to be capable of conducting heat to the heat-curable adhesive.

4,413,657

EXHAUST PIPE WITH VIBRATION DAMPING

Takesada Sasaki, Machida; Hiroshi Endo, Zama; Yoshimasa Zama, Sagamihara; Masahiko Shiraishi, Nakatsu; Yosinari Miura, Nakatsu, and Masayuki Yamaguchi, Nakatsu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Sep. 8, 1981, Ser. No. 300,398

Claims priority, application Japan, Sep. 9, 1980, 55-125010

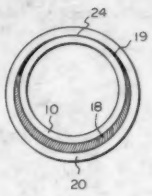
Int. Cl.³ F16L *9/14*

U.S. Cl. 138—149 **4 Claims**

1. An exhaust pipe for discharging hot gas from an internal combustion engine comprising:

an inner tube and an outer tube, the inner surface of the outer tube and the outer surface of the inner tube defining an annular region therebetween;

a heat-resistant intermediate layer filled between said inner tube and said outer tube over the entire distance of said annular region as seen in the longitudinal direction of said inner and outer tubes and having a thickness of from about 0.1 to 0.5 mm, said heat-resistant intermediate layer comprising a continuous length of heat-resistant material, said length



of said heat resistant material being from about 40% to 70% of the circumference of the annular region; and

a gap left in the annular clearance where said heat-resistant material is not filled.

4,413,658

WARP AND WEFT WEAVING MACHINE

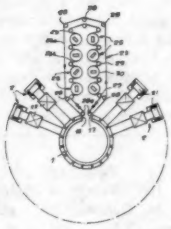
Valentin S. Vilargunte, Paseo Ramon Vall, 49-51, Navas, Spain

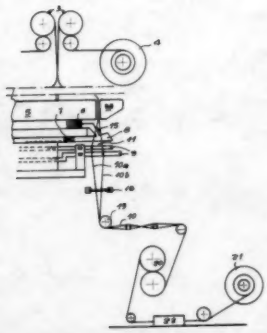
Filed Aug. 24, 1981, Ser. No. 295,330

Claims priority, application Spain, Aug. 25, 1980, 494,902

Int. Cl.³ D03D *47/26, 37/00, 47/24*

U.S. Cl. 139—436 **13 Claims**





1. A warp and weft weaving machine which comprises: means for providing a warp of parallel threads; means for holding the formed woven fabric; and at least one continuous row of heddles disposed between these two means and actuable in turn from an inlet end of the row to an outlet end thereof to form a continuous shed which moves between said two ends; weft-inserting means; a continuous row of drive plates, which plates are adapted to form, across the shed, a supporting guide for the weft-inserting means; at least one undulating unit for moving the weft-inserting means across the continuous shed in synchronism therewith from inlet end to outlet end so as to tension the weft threads, which are con-

nected to the warp threads by inversion of the relative positions of tenters forming the shed; at least one inserting-means loading station adapted to load onto each said inserting means a measured length of weft thread corresponding to the consumption of thread for forming a weft pass; and means for moving the weft-inserting means between the outlet end of the shed and its inlet end, said means extending along a path in which is located said at least one loading station, said means for moving said weft-inserting means including means for positively supporting said weft-inserting means along said path between the outlet and inlet ends of the shed and for positively supporting said weft-inserting means as the latter are transferred from said outlet end of said shed to said moving means and from said moving means into said inlet end of said shed.

4,413,659

APPARATUS FOR FEEDING SPIRAL WIRE SPRINGS FROM COILING MACHINES TO A SPRING CORE ASSEMBLY MACHINE

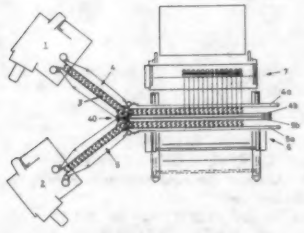
Ernst Zängerle, St. Gallen, Switzerland, assignor to Spühl AG, St. Gallen, Switzerland

Filed Dec. 28, 1981, Ser. No. 335,030

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1981, 3101014

Int. Cl.³ B21F *27/00*

U.S. Cl. 140—3 CA **4 Claims**



1. An apparatus for supplying spiral wire springs (3) from a spring coiling machine to a spring core assembly machine (7), the spring coiling machine feeding an endless conveyor belt pair which supports end rings of the springs, said conveyor belt pair supplying springs in a row to a transfer system which removes a row of springs at a time from the conveyor belt pair and delivers said row into the spring core assembly machine by means of a plurality of gripping arms (20), wherein the transfer system is movable towards and away from the spring core assembly machine, characterized by:

(a) two spring coiling machines (1, 2) each supplying an associated endless conveyor belt pair (4, 5),

(b) the two conveyor belt pairs being arranged in parallel to each other in the area of the transfer system (6), and

(c) the transfer system including a plurality of gripping arms (20) and being periodically driven such that said gripping arms alternately remove a row of springs first from one and then from the other conveyor belt pair (4, 5).

4,413,660

APPARATUS FOR TWIST-TYING CEILING HANGERS FROM JOISTS

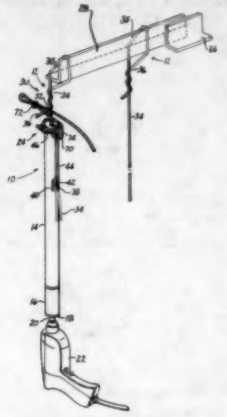
James R. Conrad, 1631 Grandview, Glendale, Calif. 91201

Filed Sep. 21, 1981, Ser. No. 304,245

Int. Cl.³ B21F *15/04*

U.S. Cl. 140—119 **18 Claims**

1. Apparatus for the rapid twist-tying of a wire ceiling hanger onto a ceiling joist, said wire hanger comprising easily bendable wire of U-shape with a relatively longer leg and a relatively shorter leg having their respective axis in a common plane and radially spaced for straddling said joist, said apparatus comprising an axially rotatable handle slidably engaging said joist-straddling wire hanger by the longer of its legs and radially inward of said hanger shorter leg, and a fork pivotally mounted on the handle having a tang and a pair of non-coplanar arms the radially outer of said arms extending downward and outward from the radially inner of said arms whereby said



fork is adapted to differentially engage and capture said shorter hanger leg for helical movement around and toward said hanger longer leg responsive to simultaneous rotation and axial displacement of said handle relative to said joist whereby said hanger shorter leg is wrapped around said hanger longer leg freely of said handle.

4,413,661

BOOM MOUNT

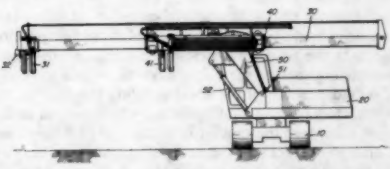
Jacques Marchildon, Amos, Canada, assignor to Harricana Metal Inc., Amos, Canada

Filed Jun. 30, 1981, Ser. No. 278,987

Claims priority, application Canada, Apr. 7, 1981, 374888

Int. Cl.³ A01G *23/08*

U.S. Cl. 144—2 Z **6 Claims**

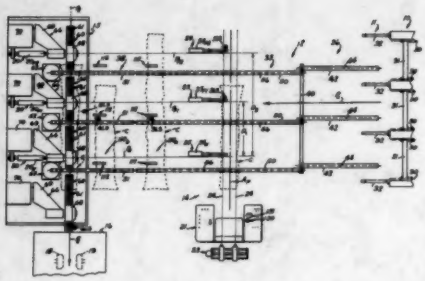


1. A tree processor comprising a mobile vehicle, a horizontally disposed extendible and retractable boom, a stripper delimber and tree gripping means mounted on the harvester and movable toward and away from one another during extension and retraction of the boom for removing limbs from trees during movement of the boom; and means mounting said boom on said vehicle, said means comprising a lever pivotally attached at first and second spaced apart positions respectively to said vehicle and to a fixed section of the boom about first and second parallel pivot axis so that the boom can be raised and lowered to respective operative and transport positions while the boom remains horizontal; lock means associated with said second pivotal connection preventing pivotal movement of the boom on the lever when said boom is in its raised operative position, said boom being in a vertical plane laterally off-set with respect to the position of said first pivot on said vehicle in a direction parallel to the pivot axis thereof; and power means for pivoting said lever about said first pivot axis.

4,413,662
EDGING SYSTEM

James L. Gregoire, Decatur; Robert D. Wismer, Roswell, and Robert L. Brouer, Conyers, all of Ga., assignors to Forest Industries Machine Corp., Convers, Ga.

Filed Jun. 8, 1981, Ser. No. 271,601
Int. Cl.[3] B27B *1/00*
U.S. Cl. 144—356 9 Claims



1. A method of orienting a cant on the infeed unit of an edger comprising the steps of:

moving the cant to a positioning station remote to the infeed unit;

arresting the movement of the cant in the positioning station;

superimposing on the cant a plurality of parallel, spaced apart, guide light beams corresponding to the paths along which the edger will trim the cant to form dimensioned lumber;

shifting the cant with respect to the guide light beams with a pair of spaced apart, manually controlled positioning mechanisms until the guide light beams lie inside the longitudinally extending wanes on opposite sides of the cant to orient the cant;

sensing the position of each of the positioning mechanisms when the cant is oriented;

storing the sensed position of each of the positioning mechanisms;

moving the cant into the infeed unit;

engaging the cant with a pair of spaced apart infeed stops at spaced apart positions corresponding to the positions at which the positioning mechanisms engaged the cant;

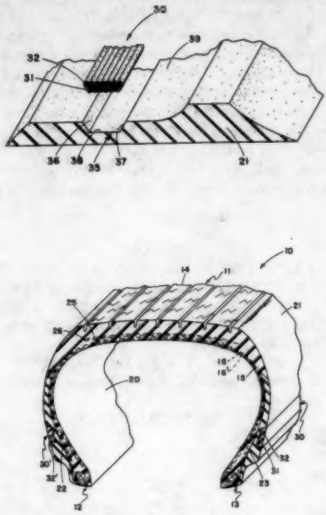
positioning each of the infeed stops according to the stored sensed position of the corresponding positioning mechanism to locate the cant on the infeed unit so that the infeed unit will feed the cant into the edger to cause the edger to trim the cant along the paths of the guide light beams at the positioning station when the cant was oriented.

4,413,663
PNEUMATIC TIRE

Gordon A. Sullenger, 3068 Kent Rd., 502C, Stow, Ohio 44224

Filed Nov. 27, 1981, Ser. No. 325,131
Int. Cl.[3] B60C *13/00*
U.S. Cl. 152—353 R 7 Claims

1. A pneumatic tire casing comprising a tread portion for receiving a tread, beam means for mounting on a rim, a pair of sidewalls, one of said sidewalls extending between one axial extremity of said tread portion and said means for mounting on a rim and the other of said sidewalls extending between the other axial extremity of said tread portion and said means for mounting on a rim, a circumferential slot in at least one of said sidewalls, and inlay ring means integrally bonded in each said circumferential slot in said sidewalls during vulcanization of said sidewalls, said inlay ring means constituted of rubber having reinforcing cord means providing stabilization and reinforcement for said sidewall, said reinforcing cord means being constituted of a continuous spiral of reinforcing cord, at

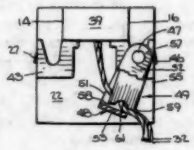


least one inlay ring means in the tire casing constituting a decorative member.

4,413,664
CORD-LOCKING DEVICE

Johannis Istha, Utrecht, Netherlands, assignor to Verosol B.V., Enschede, Netherlands

Filed Jul. 9, 1981, Ser. No. 281,850
Int. Cl.[3] E06B *9/38*
U.S. Cl. 160—178 C 10 Claims



1. A cord-locking device for cord operated window blinds adapted for use as an end cap of the upper rail supporting the blind, comprising:

a channel member generally U-shaped in cross section having two sides, a bottom, an open top and first and second ends and being elongated in a horizontal direction between the first and second ends;

an opening through the bottom of the U-shaped channel member adjacent the first end to permit the cord to pass therethrough, the direction of the cord being substantially vertical below said opening, the direction of said cord above said opening being horizontal along the direction of the open top of said channel, said cord disposed in the open top of said channel and exiting from said second end and being operative to lift or lower the window blind;

a U-shaped axle support integral with the channel member, said axle support having an open top, the open top extending in the longitudinal direction of the U-shaped channel member alongside the U-shaped channel member;

an axle disposed horizontally in the axle support parallel to the longitudinal direction of said channel member;

a housing covering at least part of the channel member adjacent the first end thereof;

a first U-shaped cord-locking member comprising side portions pivotally mounted on the axle, a bottom portion extending between the two side portions, and a cord opening through the bottom portion;

interlocking means interlocking the housing with the channel member to hold the housing firmly but removably attached to the channel member whereby when said housing is removed from said channel member, said cord is easily threaded through said cord opening in said first cord-locking member and said opening in said channel member, said housing being interlocked with said channel member after said cord is threaded therethrough; and

a second U-shaped cord-locking member comprising side portions pivotally mounted on the axle and a bottom portion substantially parallel to the bottom portion of the first member, the second U-shaped cord-locking member embracing the first cord-locking member and being spaced therefrom by a distance less than the thickness of the cord to prevent the cord from sliding relative to the U-shaped cord-locking members when the cord extends through the opening in the first cord-locking member and the second U-shaped cord-locking member overlaps the first U-shaped cord-locking member, the cord-locking members being pivotally separable by pulling the cord in a downward direction and being forced back together toward a locked position by pulling said cord at an angle from said downward direction away from said window blind thereby causing said cord-locking members to pivot upwardly toward said locked position, the tension on the cord due to the weight of the window blind in the upward direction causing said cord-locking members to reach said locked position.

4,413,665

DEVICE FOR PREVENTING OVERWINDING OF A ROLLER BLIND

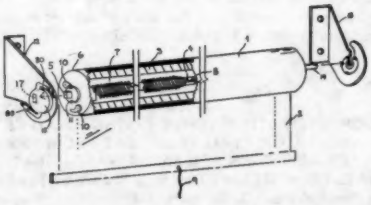
Sean Corcoran, 34, Clarinda Park West, Dun Laoghaire, County Dublin, Ireland

Filed Nov. 21, 1980, Ser. No. 209,211

Claims priority, application Ireland, Dec. 7, 1979, 2370/79

Int. Cl.³ A47G *5/02*; A47H *1/00*

U.S. Cl. 160—315 **10 Claims**



1. In or for a roller blind having an axially elongate cylindrical roller, a spindle axially disposed within a housing at one end of the roller and terminating in a flat pin which extends beyond the end of the roller, a torsion spring disposed around the spindle and means for tensioning the torsion spring such that on unwinding it may rotate the roller in a shade winding direction, the improvement comprising the provision of a slip coupling which normally acts to resist unwinding of the torsion spring when the tension in the torsion spring is at or below a predetermined tension but which when the torsion spring is overstressed is adapted to slip to permit unwinding of the torsion spring until the tension in the torsion spring is again at or below said predetermined tension.

4,413,666

EXPENDABLE DIE CASTING SAND CORE

Enno H. Page, San Lorenzo, Calif., assignor to NL Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 80,833, Oct. 1, 1979, abandoned. This application Aug. 6, 1981, Ser. No. 290,447

Int. Cl.³ B22C *3/00, 1/22, 9/10*

U.S. Cl. 164—72 **13 Claims**

1. A method for forming a die casting having an undercut region comprising:

(A) forming a die casting die having a casting surface that includes at least one expendable sand core that forms said undercut region, said sand core consisting essentially of:

(a) sand, and

(b) binding agent comprising from about 0.25 weight percent to about 5 weight percent of said sand, said binding agent consisting essentially of an acid curable resin and an oxidizing agent, said oxidizing agent comprising from about 20 weight percent to about 70 weight percent of said resin,

(c) curing said core with sulphur dioxide, and

(d) coating said cured core with a coating material consisting essentially of:

(1) from about 4 weight percent to about 30 weight percent suspending agent,

(2) from about 60 weight percent to about 95 weight percent particulate refractory material comprising calcium aluminate particles having an average particle size of 20 to 25 microns and having no particle size greater than 40 to about 70 microns

(3) 0 to 35 weight percent liquid vehicle, and

(4) from about 1 weight percent to about 10 weight percent organic binding agent selected from the group consisting of thermoplastic resins, vinyl toluene/butadiene copolymer, styrene/butadiene copolymer, vinyl toluene/acrylate copolymer, styrene/acetylene copolymer, or acrylate homopolymers;

(B) injecting molten metal into said die casting die,

(C) permitting said injected molten metal to solidify to form said die casting having said undercut region, and

(D) removing said die casting from said die and separating said expendable core from said undercut region within said die casting.

4,413,667

SUPERVISING THE INCLINATION OF MOLD SIDES

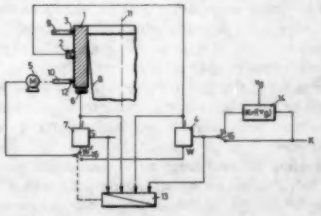
Hans Schrewe, Düsseldorf; Lothar Parschat, Essen; Klaus Franken, Krefeld, and Peter Geisbüsch, Patingen, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Mar. 10, 1982, Ser. No. 356,302

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1981, 3110012

Int. Cl.³ B22D *11/16, 11/04, 11/10*

U.S. Cl. 164—154 **6 Claims**



1. An apparatus for adjusting the inclination of a small side of a mold for continuous casting of slab ingots having a rectangular cross section, comprising:

first transducer means operatively coupled to the small mold

side for detecting an inclination thereof in relation to a direction of casting and providing an output representative thereof;

second transducer means operatively coupled to the small mold side at an end thereof for determining a gap between a casting emerging from the mold and the small mold side and producing an output representative thereof;

adjusting means coupled to the small mold side for positioning and inclining the small mold side in response to control signals received;

first controller means connected to the first transducer means for receiving the output thereof and further connected for receiving a first reference signal indicative of a desired inclination for the small mold side and providing a correction signal in response to the output of the first transducer means and the first reference signal; second controller means connected to the second transducer means for receiving the output thereof and further connected for receiving a second reference signal indicative of a desired gap between the emerging casting and the small mold side, and providing a correction signal in response to the output of the second transducer means and the second reference signal; and

selector means operatively associated with said first and second controller means for applying one or the other of the corrective signals as control signals to the adjusting means.

4,413,668

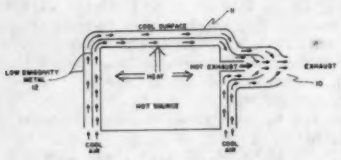
THERMAL SIGNATURE SUPRESSION

Edward F. Allard, 8904 LaGrange St., Lorton, Va. 22079

Filed Mar. 7, 1980, Ser. No. 128,031

Int. Cl.³ F24H *3/00*

U.S. Cl. 165—1 **2 Claims**



1. A technique for reducing the thermal signature of an object having a temperature greater than its environment by:

enclosing the object in a multi-layered enclosure wherein the various layers of material are separated by a space through which cool outside air is caused to flow;

causing air cooler than the object to flow between the layers of the multi-layered enclosure to absorb heat from the surfaces of the various layers of material over which the air flows;

exhausting the heat laden air to the outside environment to effect a reduction in the temperature gradient between the object being cooled and the outside environment; and

providing additional cooling by utilizating the air flow through the air entrainment means for cooling the object whose thermal signature is being reduced, whereby a significant portion of the heat emanating from the object may be effectively exhausted to the outside environment.

4,413,669

METHOD OF HEAT EXTRACTION FROM AN AQUEOUS CARRIER MEDIUM

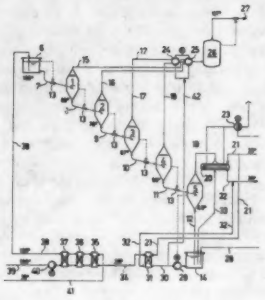
Harald Hantelmann, Ravensburg, Fed. Rep. of Germany, assignor to Escher Wyss Limited, Zurich, Switzerland

Filed Apr. 30, 1981, Ser. No. 258,929

Claims priority, application Switzerland, May 20, 1980, 3918/80; Fed. Rep. of Germany, May 30, 1980, 3020504

Int. Cl.³ F28C *3/08*

U.S. Cl. 165—1 **4 Claims**



1. A method of cooling and thereby utilizing the inherent heat of a hot industrial refuse comprising a salts laden or otherwise contaminated aqueous medium which is at a temperature below its normal boiling point and which, as a result, becomes better disposable as far as the environment is concerned, the method comprising the steps of passing the hot contaminated refuse in indirect heat transfer relation with clean boiler feed water which is at a lower temperature in a heat absorption zone to thereby heat the feed water and cool the contaminated refuse without comingling the two media; chilling the heated feed water by passing it through an expansion zone separate from the heat absorption zone and comprising a plurality of serially arranged expansion stages, whereby pure water vapor is produced from the feed water in each stage and a chilled feed water portion occurs at the last stage; passing said chilled feed water portion back to the heat absorption zone to thereby utilize that portion to cool additional hot refuse; and effecting expansion in said stages by separately withdrawing the vapors of the individual stages and subjecting the main portion of those vapors in parallel to thermo compression to produce therefrom pure consumable steam at a temperature higher than the temperature of the hot contaminated refuse which is being cooled.

4,413,670

PROCESS FOR THE ENERGY-SAVING RECOVERY OF USEFUL OR AVAILABLE HEAT FROM THE ENVIRONMENT OR FROM WASTE HEAT

Alfred E. Ritter, Mülheim, Fed. Rep. of Germany, assignor to Studiengesellschaft Kohle mbH, Mülheim, Fed. Rep. of Germany

Filed Jun. 1, 1981, Ser. No. 268,970

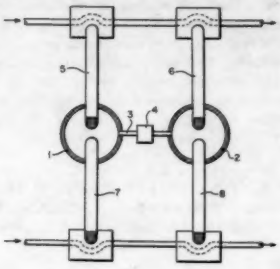
Claims priority, application Fed. Rep. of Germany, May 30, 1980, 3020565

Int. Cl.³ F28D *21/00*

U.S. Cl. 165—1 **12 Claims**

1. A process for the energy-saving recovery of useful heat from the environment or from waste heat with the use of a reversible chemical reaction of the formation and decomposition of metal hydrides, comprising the steps of: providing two vessels interconnected by lines and which are filled with about equal parts of a metal hydride and the hydride forming metal or the hydride forming alloy, alternatingly and successively charging and discharging the vessels with hydrogen by pres-

sure variation and exchanging the heat of compression and the hydride formation, removing the useful heat and replacing consumed heat of expansion and hydrogen evolution of the



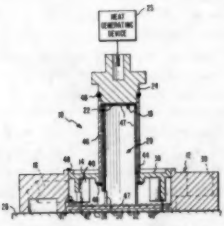
hydride by heat exchange with the environment or by waste heat, wherein the heat exchange removing useful heat and the heat exchange with the environment or waste heat is conducted by heat pipes which transfer heat only in one direction.

4,413,671

SWITCHABLE ON-OFF HEAT PIPE

Algerd Basiulis, Redondo Beach, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed May 3, 1982, Ser. No. 374,570
Int. Cl.³ F28D *15/00*; F28F *13/00*
U.S. Cl. 165—1 **13 Claims**



13. A method for respectively preventing and allowing heat transfer between a source of heat and a heat sink below and above a predetermined temperature in a heat pipe having an evaporator at the heat source, a condenser at the heat sink and a working fluid and an inert gas sealed in the heat pipe, comprising the steps of thermally insulating the heat source from the heat sink, providing a reservoir for the inert gas and maintaining the reservoir at a temperature less than that of the condenser.

4,413,672

CENTRAL DESK AIR CONDITIONING CONTROL SYSTEM

Donald L. Sidebottom, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Apr. 5, 1982, Ser. No. 365,764
Int. Cl.³ F24F *3/00*; G05D *23/00*
U.S. Cl. 165—22 **12 Claims**

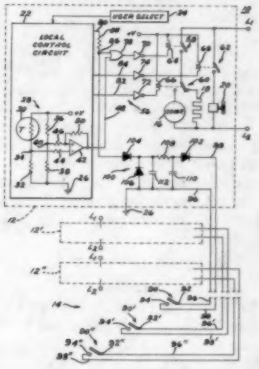
1. An air conditioning system including a plurality of air conditioning units and a central control system, said air conditioning system comprising:

at least one major energy-consuming load included in each of said air conditioning units;

relatively local control circuitry respectively connected to each of said air conditioning units for directing the respective major energy-consuming load to cycle on and off as required to maintain a desired temperature in a space conditioned by the respective units;

circuitry included within each of said air conditioning units defining a reference potential, and a terminal at the reference terminal;

a controlled power switching circuit for the respective major energy-consuming load included within each of said air conditioning units, each of said controlled power switching circuits having both a normal mode in which said major energy-consuming load operates in response to said local control circuitry to maintain the desired temperature and a low-energy mode in which operation of said major energy-consuming load is disabled, and each of said controlled power switching circuits having a control input effective when connected to the reference potential to select one of said modes and effective when not con-



nected to the reference potential to select the other of said modes;

a relatively remote control switch for each of said air conditioning units, each of said relatively remote control switches having two terminals connected via conductors respectively to said reference terminal and to said control input in the corresponding air conditioning unit such that said one of said modes is selected when said remote control switch is closed without affecting said relatively local control circuitry; and

a protective network included in each of said air conditioning units interposed between said conductors and said reference terminal and said control input, said protective network including elements arranged to prevent damage to said local control circuitry, said reference circuitry, or to said power switching circuit in the event voltage of either polarity is inadvertently applied to said conductors.

4,413,673

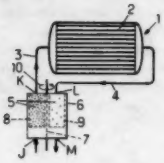
DEVICES FOR SUPPLYING TUBE EXCHANGERS WITH CLEANING BODIES AND FOR RECOVERING THESE BODIES

Herve C. de Maigret, 310 Stenton Ave., Plymouth Meeting, Pa. 19462

Filed Oct. 18, 1982, Ser. No. 434,727
Int. Cl.³ F28G *1/12*
U.S. Cl. 165—95 **9 Claims**

1. A device for cleaning the tubes (2) of a heat exchanger (1) through which flows a fluid (F) coming from an upstream duct (3) and discharged into a downstream duct (4), comprising a plurality of cleaning bodies (5) adapted to be immersed in the circulating fluid and carried along thereby into the tubes for the purpose of cleaning these latter, and means for injecting said cleaning bodies into the upstream duct and for collecting

these bodies from the downstream duct while separating them at that time from the carrier fluid, characterized in that the injection and collection means comprise: a sealed box (6) provided with four apertures (J,K,L,M) connected externally so that two of them (J,K) define axially a section of the upstream duct (3) and the other two (L;M) define axially a section of the downstream duct (4); a rotary support (7) mounted in this box and forming therewith two diametrically opposite compartments A and B which define the two above duct sections for one of the angular positions of this rotary support; means for



providing the sealing between these two compartments; two identical baskets (8,9) for collecting the cleaning bodies, in which baskets the lateral wall and/or the bottom are chosen so as to let the fluid, but not the cleaning bodies, pass therethrough, these baskets being mounted on the rotary support, in respectively the two compartments, so as to be open solely in the direction of the exchanger for the above angular position of said support; and means (10) for rotating this support through 180° about its axis (X) so as to switch over the two compartments as well as their baskets.

4,413,674

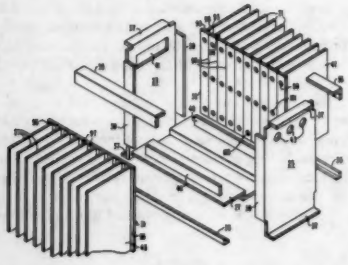
TRANSFORMER COOLING STRUCTURE

Randall N. Avery; Charles A. Clayton; Levon R. Floyd; Douglas B. Mackintosh, all of South Boston; Willie A. Powell, Alton, and Michael W. Atkins, Danville, all of Va., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 211,147, Nov. 28, 1980, abandoned. This application Mar. 4, 1983, Ser. No. 472,327

Int. Cl.³ F28D *15/00*; **H01F** *27/14*

U.S. Cl. 165—104.33 **11 Claims**



1. A tank for electrical apparatus submerged in a cooling fluid for transferring heat from said apparatus to walls of the tank for dissipation therefrom, comprising wall means forming a fluid-containing casing, at least a portion of the wall means having inlet and outlet means for said fluid, a cooling panel extending outwardly from said wall means for dissipating heat to an ambient atmosphere, the cooling panel comprising a pair of oppositely disposed sides having facing peripheral edge portions and end portions that are secured together in a fluid-tight seal, the sides being sheet-like members formed to include aligned corrugated surfaces forming spaced fluid-conducting headers and fluid conduits, one of the sides of the oppositely disposed sides having a first outturned flange along the panel edge opposite the peripheral edge portion, the other of said sides having a second outturned flange extending in a direction opposite the first flange, the first and second flanges solely comprising said wall means of the tank with the cooling panel being the sole reinforcement of the wall means against internal pressures within the tank, one header extending from the outlet means and the other header extending from the inlet means, the fluid conduits extending between the spaced headers, whereby volume of cooling fluid space is minimized, and each cooling panel having a portion extending above the outlet means so as to accommodate any expansion of cooling fluid where excess heating occurs.

4,413,675

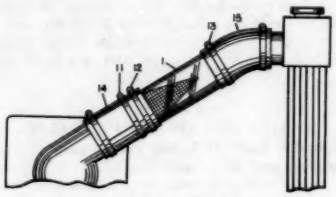
COOLING SYSTEM PROTECTIVE DEVICE

Lloyd D. Gano, 1205 Sandalwood La., Los Altos, Calif. 94022

Filed Aug. 10, 1981, Ser. No. 291,580

Int. Cl.³ F28F *19/00*

U.S. Cl. 165—119 **9 Claims**



1. In a cooling system in which a continuous stream of coolant fluid normally flows in a given path from an engine to a radiator, a filter assembly comprising: first means including a first particle filtering screen extending across the flow path of said stream of fluid so as to prevent large particles, that is, particles of a predetermined size or larger, within said stream from passing through said screen and reaching said radiator from said engine; and second means including a second particle filtering screen extending across said flow path upstream of and spaced from said first screen for preventing said large particles from passing therethrough, said second screen including a through-hole which is sufficiently large to allow said large particles to pass therethrough but smaller in area than the cross-section of said stream, said through-hole being positioned within said stream to allow said large particles to pass into the space between said first and second screens during the normal direction of flow of said stream while preventing said large particles, once they are within said space, from readily passing back out said through-hole in the event said stream is caused to flow in the opposite direction.

4,413,676

OIL WELL MONITORING DEVICE

Kendall G. Kervin, Scio, N.Y., assignor to Well Research, Inc., Scio, N.Y.

Filed Sep. 4, 1981, Ser. No. 299,408

Int. Cl.³ E21B *43/00*; **F04B** *49/00*

U.S. Cl. 166—53 **20 Claims**

1. An oil well monitoring device for an oil well having a motor-driven pump controlled by a first control switch, comprising, in combination:

a housing adapted to be connected in the fluid flow exit from the pumped well;

a fluid flow switch in said housing adapted to be actuated upon fluid flow from said well;

a resistance probe in said housing to sense the resistance of the pumped fluid relative to the housing wall; and

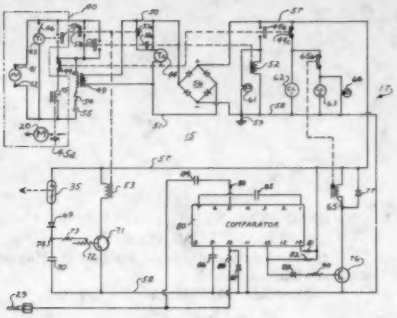
an electrical circuit for said motor;

said electrical circuit including first means connected to said

fluid flow switch for determining the existence of fluid flow from the well,

said first means including hold-in contact means connected across the first control switch to maintain pump actuation despite first control switch opening,

a total flow indicator controlled by said first means,



second means including said resistance probe for determining the difference between oil flow and water flow and controlling an flow indicator,

third means including a time switch to terminate pump motor energization upon an absence of fluid flow from the well despite the closed first control switch, and

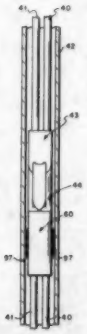
fourth means to maintain said third means energized despite de-energization of said pump motor.

4,413,677

DUAL STRING WELL PACKER

Donald H. Perkins, Carrollton, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Apr. 27, 1982, Ser. No. 372,138
Int. Cl.³ E21B *29/00, 23/08*
U.S. Cl. 166—55.1 **16 Claims**



1. A well packer comprising:

a. a pair of parallel mandrel means, each having a passageway extending therethrough;

b. upper and lower body means carried on the exterior of the mandrel means and slidable longitudinally with respect to each other over the mandrel means;

c. anchoring means carried by each body means and radially expandable relative to each body means between a retracted position and an expanded position whereby each anchoring means is engageable with the interior of a casing string to prevent longitudinal movement of its associated body means relative to the casing string;

d. packing means carried on the exterior of the mandrel means between the upper and lower body means;

e. piston means, carried by said mandrel means, for moving the body means longitudinally toward each other in response to fluid pressure in one of the passageways;

f. the longitudinal movement of the body means causing compression of the packing means and radial expansion thereof to form a fluid barrier between the exterior of the mandrel means and the interior of the casing string;

g. the same longitudinal movement causing radial expansion of the anchoring means;

h. means for locking the lower body means to the mandrel means after completion of the longitudinal movement whereby the packing means are maintained compressed and the anchoring means are maintained radially expanded;

i. each anchoring means comprising a plurality of slip elements;

j. each body means further comprising a slip carrier and a slip expander which are movable longitudinally towards each other to radially expand the associated slip elements;

k. means for releasing the mandrel means from the locking means of the lower body means; and

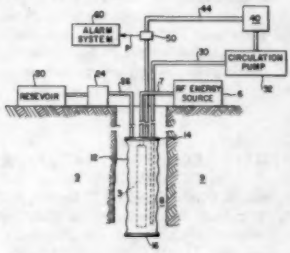
l. means for moving the slip expander of the upper body means longitudinally away from its associated slip carrier to allow retraction of the slip elements carried by the upper body means after the locking means for the lower body means has been released.

4,413,678

ALARM MEANS FOR USE WITH APPARATUS PROTECTING A DEVICE SITUATED IN A BOREHOLE

Ronald G. Gillespie, Old Tappan, N.J., assignor to Texaco Development Corporation, White Plains, N.Y.

Filed Jan. 29, 1981, Ser. No. 229,699
Int. Cl.³ E21B *33/12*
U.S. Cl. 166—57 **7 Claims**



1. An improvement to an apparatus for the in-situ recovery of hydrocarbons from an oil shale deposit wherein an RF antenna is entered into a borehole traversing the oil shale desposit and is energized so as to heat the oil shale deposit, comprising

inflatable, non-conductive means encompassing said RF antenna for protecting the antenna,

means for inflating said inflatable means with a fluid so as to prevent portions of the heated oil shale deposit from contacting said RF antenna,

means for sensing the pressure of the fluid and providing a corresponding pressure signal, and

means for providing an alarm in accordance with the pressure signal when the pressure of the fluid has decreased; said alarm means includes

sample and hold means which periodically sample and hold the pressure signal,

means connected to the sample and hold means for comparing the current cycle pressure with the previous cycle

pressure and providing a comparison signal in accordance therewith, and

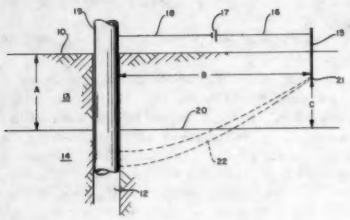
means connected to the comparison means for providing an alarm when the pressure of the current cycle is less than the pressure of the next previous cycle.

4,413,679

WELLBORE CATHODIC PROTECTION

Thomas K. Perkins, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed May 7, 1982, Ser. No. 375,842
Int. Cl.³ E21B 41/02, 36/04
U.S. Cl. 166—248 3 Claims



1. In a method for the cathodic protection of metal conduit in a wellbore, said wellbore being in part in permafrost which has an electrical resistance greater than that of unfrozen earth, wherein said cathodic protection involves impressing a predetermined electrical current by way of a variable voltage in the earth between said conduit and an anode, said anode being set into the earth a finite distance which is less than the depth of the permafrost, said anode being spaced away from said wellbore, the improvement comprising placing said anode a distance away from said wellbore which is greater than the distance between the bottom of said anode and the bottom of said permafrost, and increasing the impressed voltage sufficiently to match the increased resistivity of the permafrost to thereby maintain said predetermined current between said wellbore and anode, whereby at least part of said current between said wellbore and anode passes downwardly through said permafrost into unfrozen earth below the permafrost.

4,413,680

PERMEABILITY REDUCTION IN SUBTERRANEAN RESERVOIRS

Burton B. Sandiford, Placentia; Hoai T. Dovan, Fullerton, and Richard D. Hutchins, Placentia, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Dec. 21, 1981, Ser. No. 332,940
Int. Cl.³ E21B 43/22, 33/138
U.S. Cl. 166—270 25 Claims

1. A method for reducing the permeability of the higher permeability zones of a subterranean reservoir having heterogeneous permeability penetrated by at least one well comprising injecting through a well and into said reservoir about 2 to 800 barrels per vertical foot of reservoir to be treated of an aqueous solution or dispersion of (1) a water-soluble or water-dispersible polymer selected from the group consisting of acrylic acid-acrylamide copolymers, polyacrylamides, partially hydrolyzed polyacrylamides, polyalkyleneoxides, carboxyalkylcelluloses, hydroxyethylcelluloses and heteropolysaccharides obtained by the fermentation of starch-derived sugar, (2) a cross-linking agent for the polymer comprising a water-soluble salt of a polyvalent cation which reacts in solution to form a colloidal hydroxide selected from the group consisting of an alkali metal or ammmonium aluminate or tungstate, and (3) an amount of a water-soluble alkaline material selected from the group consisting of alkali metal and ammonium hydroxides, alkali metal silicates, and alkali metal phosphates sufficient to raise the pH of the overall aqueous solution or dispersion to about 10 or above, passing the said aqueous solution or dispersion through the reservoir until the pH has fallen to about 9 or below, and shutting in the well until the reservoir permeability has been reduced.

4,413,681

METHOD OF CEMENTING A WELL BORE USING A FLUID LOSS ADDITIVE

Lee F. McKenzie, Arlington, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Jun. 14, 1982, Ser. No. 388,334
Int. Cl.³ E21B 33/138, 33/14
U.S. Cl. 166—293 4 Claims

1. A method of cementing a well bore, comprising the steps of:

mixing together a hydraulic cement, water in an amount to produce a pumpable slurry, and a fluid loss additive comprising the reaction product of a polyamine compound selected from the group consisting of polyalkylenepolyamines, polyalkylenimines, and mixtures thereof, and a high molecular weight sulfonated polymer, said sulfonated polymer having a molecular weight in the range of 500,000 to 8,000,000;

pumping said cement slurry to the desired location in said well bore; and

allowing said cement slurry to harden to a solid mass.

4,413,682

METHOD AND APPARATUS FOR INSTALLING A CEMENTING FLOAT SHOE ON THE BOTTOM OF A WELL CASING

Rudy B. Callihan, San Antonio, and Clyde Wainwright, McQueeney, both of Tex., assignors to Baker Oil Tools, Inc., Orange, Calif.

Filed Jun. 7, 1982, Ser. No. 385,614
Int. Cl.³ E21B 33/14, 34/08
U.S. Cl. 166—382 8 Claims

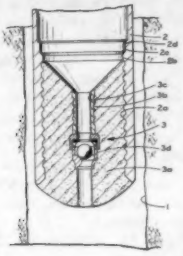
7. The method of installing a cementing float shoe in the bottom of a well casing comprising the steps of:

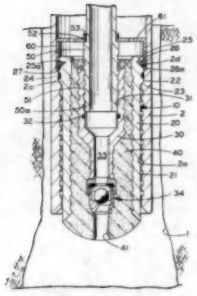
(1) providing in the bore of the well casing immediately above the desired location of the cementing float shoe a cylindrical seal bore surface and an upwardly facing locating shoulder;

(2) running in the well on a workstring a cementing float shoe having a downwardly facing external abutment surface adjacent an external annular seal, and radially expandable slips disposed above the external annular seal;

(3) engaging the external annular seal with the cylindrical seal bore surface and engaging the downwardly facing

external abutment surface on the cementing float shoe with the upwardly facing locating shoulder;





(4) expanding the radially expandable slips into engagement with the adjacent inner wall of the casing by manipulation of the workstring;

(5) detaching the workstring from the cementing float shoe.

4,413,683

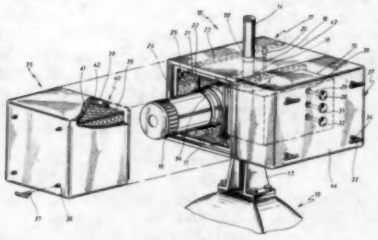
FIREPROOF ENCLOSURE FOR VALVE ACTUATOR

R. G. Hune, Sugarland, Tex., assignor to Thermal Designs, Inc., Houston, Tex.

Filed Oct. 20, 1980, Ser. No. 198,452

Int. Cl.³ A62C *7/00*

U.S. Cl. 169—48 **16 Claims**



1. A fireproof enclosure for protecting a valve actuator, said fireproof enclosure comprising a plurality of units, one of said units being a center unit adapted for mounting upon a valve actuator and each other unit being an extension unit adapted for mounting upon the center unit to form a tight seal therewith, each unit having a substantially box-shaped frame with expanded metal sides, there being no expanded metal side where an extension unit is mounted upon the center unit, wherein the tight seal between the center unit and each extension unit is formed by a stepped flange capable of precluding a flame path into said fireproof enclosure and wherein the box-shaped frame of each unit, exclusive of each stepped flange, is substantially completely encased in a homogeneous body of refractory material formed by vacuum molding from a slurry of refractory material into a mold surrounding the exterior of the substantially box-shaped frame of each unit and curing the refractory material deposited thereby.

4,413,684

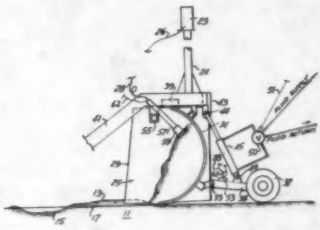
LASER-CONTROLLED GROUND LEVELING DEVICE WITH OVERFILL SENSOR AND WHEEL RISE LIMITING DEVICE

Timothy V. Duncklee, 3124 Collee Ct., Naples, Fla. 33942

Filed Jul. 27, 1981, Ser. No. 287,525

Int. Cl.³ E02F *3/76*; A01B *63/112*

U.S. Cl. 172—4.5 **4 Claims**



1. In an earth leveling laser beam control system comprising earth scraping and storing means controllably displaceable over rough terrain for leveling said terrain, level defining laser beam transmitting means, laser beam receiving means mounted on said earth scraping and storing means, indicating means associated with said laser beam receiving means for indicating alignment of said earth scraping and storing means with said laser beam, and control means for lowering and raising said earth scraping and storing means for leveling said rough terrain to a pre-determined grade level as defined by said laser beam, the improvement comprising overfill sensor means in said scraping and storing means for detecting an excess of scraped earth in said scraping and storing means, means actuated by said overfill sensor means for dumping earth from said scraping and storing means upon receiving an appropriate signal from said overfill sensor means for preventing overfilling of said scraping and storing means, means actuated by said indicating means for preventing said control means from lowering said earth scraping and storing means while said indicating means is on, ground engaging wheels, pivotable support means interconnecting said ground supported wheels and said earth scraping and storing means, and control means mounted on said pivotable support means for maintaining said pivotal support means below a pre-determined angle for limiting the rise of said ground engaging wheels above the ground.

4,413,685

PLANTER IMPLEMENT WITH ADJUSTING POSITION-DISPLAY APPARATUS AND SYSTEM THEREOF

Philip E. Gremelspacher, and Cornelius J. Gremelspacher, both of Rte. No. 1, Walton, Ind. 46994

Continuation-in-part of Ser. No. 102,635, Dec. 11, 1979, abandoned, which is a continuation of Ser. No. 831,558, Sep. 8, 1977, abandoned. This application Mar. 21, 1980, Ser. No. 131,944

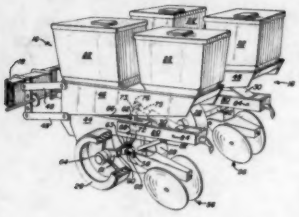
Int. Cl.³ A01B *63/111*

U.S. Cl. 172—316 **29 Claims**

7. In combination with a planter implement having a lift/-

lower system for moving said implement between a raised position for transport and a lowered position for planting and being designed for control from a remote operator's position, said planter implement having a plurality of planting units each including planting components and a ground engaging gauge element for support of the respective planting unit on the ground while in said planting position and each adjustable as to the depth setting of the respective planting components relative to the respective gauge element, the improvement comprising:

each of said planting units including power means for adjusting the relative positional setting between the planting



components of the respective unit and the respective gauge element to determine the planting depth setting of each respective planting unit;

means for actuating each of said power means independently of the actuation of each other such power means to adjust the depth setting of such planting components of the respective planting unit independently of the depth setting of each other such planting unit; and

control means mounted at the operator's position and adjustable by the operator to provide an operator-selected depth setting control signal to said actuating means, whereby each of said power means is independently controlled to maintain the depth setting selected by the operator.

4,413,686

WEDGE ARRANGEMENT FOR LOCKING TOGETHER HAMMERHEAD AND ANVIL

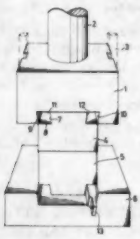
Erik Sundberg, Hofors, Sweden, assignor to Waller Innovation AB, Hofors, Sweden

Continuation of Ser. No. 198,998, Oct. 21, 1980, abandoned. This application Apr. 8, 1983, Ser. No. 483,413

Claims priority, application Sweden, Feb. 5, 1980, 8000908

Int. Cl.³ B25D *17/08*

U.S. Cl. 173—131 **4 Claims**



1. A hammerhead (1) and anvil (4) locking arrangement, comprising:

(a) a resiliently deformable locking wedge (14) having converging, opposite, planar side surfaces (16, 17),

(b) means defining a first planar locking surface (7) on an anvil,

(c) means defining a second planar locking surface (9) on a hammerhead,

(d) said first and second locking surfaces converging at an angle equal to an angle of convergence of said wedge, defining between them a wedge receiving groove, and being inclined to a vertical plane, and

(e) an insertion draw head (18) defined on a leading, relatively narrow end (20) of said wedge for tensioning said wedge to draw it firmly into the groove in mating engagement with the locking surfaces and to simultaneously longitudinally extend and laterally contract the wedge, and for releasing said tension to longitudinally contract and laterally expand the wedge to firmly lock it in said groove.

4,413,687

HYDRAULICALLY OPERATED IMPACT DEVICE

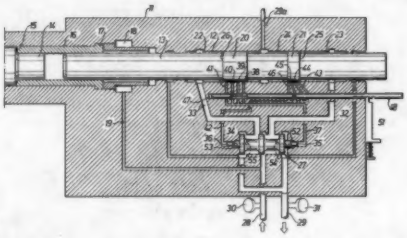
Ake T. Eklöf, Skärholmen, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Feb. 13, 1981, Ser. No. 234,444

Claims priority, application Sweden, Feb. 20, 1980, 8001325

Int. Cl.³ B25D *9/18*

U.S. Cl. 173—134 **14 Claims**



1. In a hydraulically operated impact device, for example a rock drill, comprising a housing (11); a cylinder (12) in said housing; an anvil means (14); a hammer piston (13) which is reciprocably mounted in said cylinder and arranged to impact upon said anvil means; and first and second port means (38–41; 43–46) in said cylinder cooperating with said hammer piston for controlling the reciprocation of said hammer piston, said first port means being arranged for initiating the work stroke when said hammer piston reaches a predetermined variable rear position during its return stroke and said second port means being arranged for initiating the return stroke when said hammer piston reaches a variable forward position during its work stroke,

the improvement comprising:

first means for selectively varying the working fluid flow through said first port means so as to provide for stroke length selection, the second means for selectively varying the working fluid flow through said second port means, said first and second means being operatively coupled together for selectively varying said working fluid flow through said first and second port means in a predetermined bound relationship.

4,413,688

DIVERTER VALVE

Joe M. Seabourn, 301 Birch St., Apt. 248, Lafayette, La. 70506

Filed Jun. 5, 1981, Ser. No. 271,002

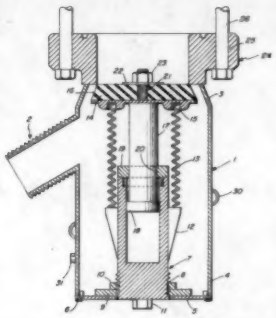
Int. Cl.³ E21B *21/10*

U.S. Cl. 175—38 **3 Claims**

1. A diverter valve for preventing blow-outs, during the early stages of drilling, which can be caused by sudden pressure surges encountered by the drilling bit in drilling an oil well, by rapid release of said pressure surges prior to forced movement of unwanted fluid up outside the casing comprising, in combination, a housing having an inlet aperture and an exhaust aperture the exterior whereof is free from any obstruction to the movement of fluidized solid materials therethrough, a rubber gasket adapted to close said inlet aperture,

a spring mounted within said housing so as to engage said gasket and press it against said inlet aperture so as to close it,

said exhaust aperture being located in the vicinity of the annulus formed when said rubber gasket is moved away from said inlet aperture in such a direction as to compress said spring, the size of said exhaust aperture being sufficiently great and location of said exhaust aperture being sufficiently close to said inlet aperture so as freely to release drilling mud and other fluidized solid materials from said annulus,



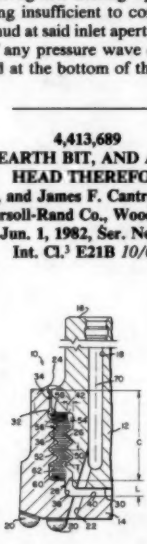
and means for adjusting the compression of said spring so as to compensate for the normal pressure of drilling mud at said inlet aperture during the drilling operation, said adjusted compression being insufficient to compensate for the pressure of drilling mud at said inlet aperture upon arrival at said inlet aperture of any pressure wave caused by excess pressure encountered at the bottom of the well during the drilling operation.

4,413,689

PLURAL-PART EARTH BIT, AND AN IMPROVED BIT HEAD THEREFOR

Robert W. Hughes, and James F. Cantrel, both of Easton, Pa., assignors to Ingersoll-Rand Co., Woodcliff Lake, N.J.

Filed Jun. 1, 1982, Ser. No. 383,976
Int. Cl.³ E21B *10/00*
U.S. Cl. 175—409 **33 Claims**



1. An improved bit head, for a plural-part earth bit, said head having a central axis, and an axially-extended cavity formed therein; said cavity defining a first wall, substantially smoothly threaded and of a given pitch diameter, which circumscribes said axis, wherein the improvement comprises:

means lining said first wall defining a second, threaded wall which circumscribes said axis,

said defined second wall having a thread with a pitch diameter which is less than said given diameter; wherein

said lining means comprises means which, along a given radial plane drawn outwardly from said axis, defines a plurality of lamina;

each lamina of said plurality, along said given plane, terminates radially inwardly in an individual, rigid, surface of a given axial dimension;

the median of any one of said individual surfaces, of a plurality of said surfaces, measured along said given radial plane, is disposed at a given radial distance from said axis; and

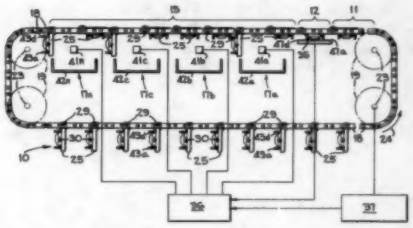
the median of another such surface immediately adjacent to said any one individual surface, measured along said plane, is disposed at a radial distance from said axis other than said given distance.

4,413,690

WEIGHING CUP

Shepard J. Peterson, Anaheim, Calif., assignor to FMC Corporation, Chicago, Ill.

Filed Mar. 12, 1982, Ser. No. 357,460
Int. Cl.³ B07C *5/28*
U.S. Cl. 177—54 **13 Claims**



1. Apparatus for weighing articles held in spaced article receiving cups arranged in single file on a conveyor, each of the articles being weighed as the corresponding cup moves through a weighing zone, said apparatus providing accurate weighing of each article irrespective of the orientation of the article in the cup, said apparatus comprising:

at least one front weighing peg mounted to a front portion of said receiving cup;

a pair of rear weighing pegs mounted to a rear portion of said receiving cup;

a weighing cell which provides an output signal proportional to a weight supported by said weighing cell;

at least one front weigh bar mounted to said weighing cell to support said front weighing peg as said cup moves through said weighing zone;

a pair of rear weigh bars mounted on said weighing cell to support said rear weighing pegs as said cup moves through said weighing zone; and

wherein said front and said rear weigh bars are positioned so said front peg is supported by said front weigh bar at the same time that said rear pegs are supported by said rear weigh bars.

4,413,691

SHEAVE BLOCK WEIGHING ASSEMBLY

Donald C. Wetzel, Berea, Ohio, assignor to Quest Corporation, Macedonia, Ohio

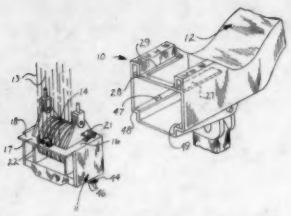
Filed Oct. 23, 1981, Ser. No. 314,361
Int. Cl.³ G01G *19/14, 3/14;* **B66C** *1/40*
U.S. Cl. 177—147 **7 Claims**

1. A sheave basket weighing system for a material handling apparatus comprising:

a sheave basket having sheaves and supported by lifting ropes, the sheave basket also having generally horizontally extending ledges;

three bending beam load cells fixed on the ledges of the sheave basket to provide a three-point support system, all

three of the load cells being immovable with respect to the sheave basket, and



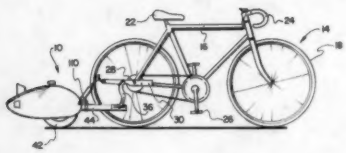
a ladle hanger assembly having generally horizontally extending surfaces which are supported on top of the load cells.

4,413,692

POWER ASSISTING DEVICE FOR A MANUALLY OPERABLE VEHICLE

Dale L. Clifft, 13530 Herron St., Sylmar, Calif. 91342

Filed Oct. 13, 1981, Ser. No. 310,798
Int. Cl.³ B62M 7/14
U.S. Cl. 180—11 **6 Claims**



1. In combination with a vehicle having a plurality of wheels, a frame connecting said wheels, said wheels comprising a leading wheel and a trailing wheel, a power assisting assembly for said vehicle comprising:

a motor;

a mounting frame, said motor being mounted on said mounting frame;

a driving wheel rotatably driven through a driving belt assembly by said motor, said driving wheel being longitudinally spaced rearwardly of said trailing wheel, said driving wheel being mounted by a suspension system on said mounting frame; and tensioner means mounted on said mounting frame for continuously maintaining taut said driving belt assembly.

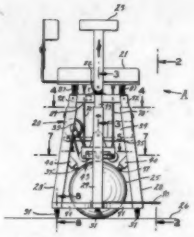
4,413,693

MOBILE CHAIR

Sherwin L. Derby, 904 Susan Ct., O'Fallon, Ill. 62269

Filed Mar. 27, 1981, Ser. No. 248,405
Int. Cl.³ B60K 7/00
U.S. Cl. 180—74 **11 Claims**

1. A compact mobile self-propelled chair including a frame carrying a passenger seat and a prime mover and characterized by a spherical body for carrying at least in part the weight of said chair and passenger and providing frictional rolling engagement with a support surface, means for captively mounting said spherical body for rotation relative to said frame about a plurality of axial orientations, drive means for interconnecting said spherical body and said prime mover for driving rotation of said spherical body, and control means responsive to postural shifting by said passenger for controlling the axial orientation during rotation of said spherical body for thereby determining the direction of movement of said chair, said spherical body being substantially centered beneath the combined weight of said chair and passenger for primarily carrying said combined weight, and auxiliary support means providing rolling engagement with said support surface around said spherical body for providing stablizing auxiliary support of said combined weight, said prime mover comprising a first electric motor and first switch means operatively associated with said seat for selectively controlling the provision of said electric power to said electric motor, said source of power comprising a battery carried by said chair, said first switch



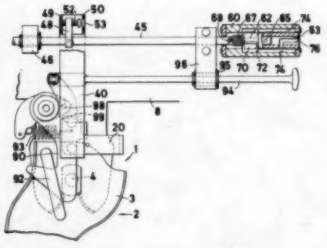
means being operative in response to postural shifting by said passenger in a desired direction of translational movement to supply electric power from said battery to said motor, said control means comprising means carried by said frame for providing selective frictional engagement of said chair with said support surface upon postural shifting by said passenger in a desired direction of turning movement for causing rotation of said spherical body about an axis producing turning of said chair.

4,413,694

LOCK ASSEMBLY FOR A TILTABLE TRUCK CAB

Joseph Slocombe, Chelmsford, and Michael A. Parry, Billericay, both of England, assignors to Ford Motor Company, Dearborn, Mich.

Filed Jun. 4, 1980, Ser. No. 156,230
Claims priority, application United Kingdom, Jun. 14, 1979, 7920801
Int. Cl.³ B62D 27/06, 33/06
U.S. Cl. 180—89.14 **2 Claims**



1. A lock assembly for retaining a tiltable cab structure in a normal operating position relative to the body structure of a truck and comprising two transversely spaced latches, each including a keeper attached to one of the structures, a latch member attached to the other structure and mounted for movement into and out of a closed position to effect latching engagement with the keeper, and an operating lever movable between an unlocking position in which the latch member is disengageable with the keeper and a locking position in which the latch member is retained in engagement with the keeper, and a releasing linkage interconnecting the operating levers for simultaneously moving the operating levers between the lock-

ing and unlocking positions, the operating lever and the latch member of each latch including mutually engaging cam surfaces which allow movement of the operating lever into the locking position only when the latch member is in the closed position.

4,413,695

VEHICLE WITH TILTABLE CAB

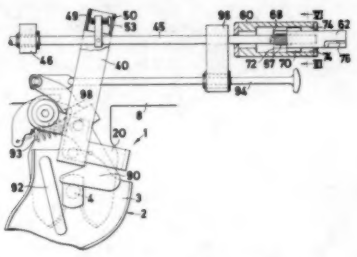
Joseph Slocombe, Chelmsford, and Michael A. Parry, Billericay, both of England, assignors to Ford Motor Company, Dearborn, Mich.

Filed Jun. 4, 1980, Ser. No. 156,231

Claims priority, application United Kingdom, Jun. 14, 1979, 7920800

Int. Cl.³ B62D *33/06*

U.S. Cl. 180—89.14 **17 Claims**



1. A motor vehicle comprising a body structure, a cab mounted on the body structure for movement about a pivot axis between a normal operating position and a tilted position, and a support radially spaced from the pivot axis for supporting the cab structure on the body structure in the normal operating position of the cab, at least one of the supports comprising a keeper attached to one of the structures and a latch member attached to the other structure and mounted for movement into and out of latching engagement with the keeper when the cab is in its normal operating position, characterized in that further support is provided for the cab spaced from the first mentioned support in the direction of the pivot axis, and comprising a keeper attached to one of the structures and having a bracket mounted on the said one structure, and a striker pin resiliently mounted in the bracket, and a latch member attached to the other structure and mounted for movement into and out of latching engagement with the keeper when the cab is in its normal operating position.

4,413,696

LATCH MECHANISM FOR A TILTABLE CAB

Joseph Slocombe, Chelmsford, and Michael A. Parry, Billericay, both of England, assignors to Ford Motor Company, Dearborn, Mich.

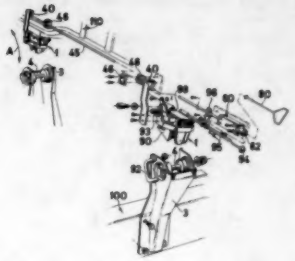
Filed Jun. 4, 1980, Ser. No. 156,239

Claims priority, application United Kingdom, Jun. 14, 1979, 7920799

Int. Cl.³ B62D *33/06*

U.S. Cl. 180—89.14 **12 Claims**

1. A lock for retaining a tiltable cab structure in a normal operating position relative to the body structure of a vehicle and comprising a latch which includes a keeper attached to one of the structures, and a latch member attached to the other structure and mounted for latching engagement with the keeper, and a releasing linkage for locking the latch member in engagement with the keeper, characterized in that the releasing linkage includes an actuating member and an operating rod connected to the actuating member and mounted for sliding movement therewith in a housing between a first position in which the latch member is locked in engagement with the keeper and a second position in which the latch member is disengageable from the keeper, the actuating member being rotatable relative to the housing and the operating rod in the



first position into a locked position wherein it is biased in which the housing prevents the sliding movement of the actuating member.

4,413,697

AIR CUSHION VEHICLE

Claude Duneau, 64 Levee des Tuileries, 41000 Blois, France

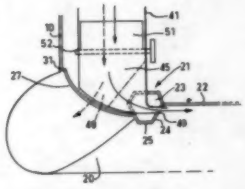
PCT No. PCT/FR81/00025, § 371 Date Oct. 30, 1981, § 102(e) Date Oct. 30, 1981, PCT Pub. No. WO81/02552, PCT Pub. Date Sep. 17, 1981

PCT Filed Mar. 3, 1981, Ser. No. 317,892

Claims priority, application France, Mar. 3, 1980, 80 040702

Int. Cl.³ B60V *1/04, 1/15*

U.S. Cl. 180—120 **8 Claims**



1. Air cushion vehicle intended to move on ground or on water, equipped with a central platform surrounded by a belt to which an inflatable skirt is fixed as well as with lifting means for establishing an air cushion under said platform, and propulsion means; wherein said belt surrounding the platform provides under said platform a first face directed obliquely toward the vertical central axis of the platform and downward, and a second horizontal face extending toward the outside of the platform to form a support pad; with at least one nozzle connected to the lifting means, opening under the platform into said first oblique face of the belt for the creation of the air cushion, said belt being equipped on its outer periphery with a shaped piece for fixing the skirt.

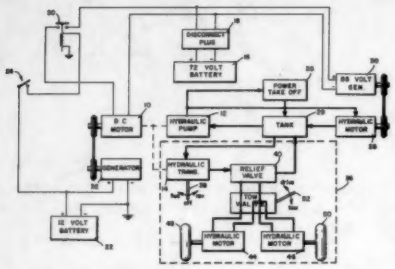
5. Vehicle according to claim 1, wherein the lifting means include a propeller, a duct having an inlet positioned under and directly behind the propeller and equipped with a first distribution flap pivotally mounted around a horizontal shaft from a closed position of said inlet to various positions of admission and channeling of the air flow created by the propeller toward the duct, with said duct being divided in two sections by a vertical partition positioned directly behind a second pivotally mounted flap for dividing the admitted air as needed in the duct toward each of said two sections, the first one of said two sections ending by a nozzle opening into the skirt through the shaped piece and the second one of said two sections, after having matched the outline of said shaped piece, ending through a nozzle which opens under the platform, through the first oblique face of the belt.

4,413,698

BATTERY OPERATED HYDRAULIC VEHICLE

Walter W. Conrad, 1751 Iris Ave., Torrance, Calif. 90503, and James G. Hebert, Jr., 12523 Inglewood Ave., Apt. 14, Hawthorne, Calif. 90250

Filed Jan. 21, 1981, Ser. No. 226,942
Int. Cl.³ B60K 1/04
U.S. Cl. 180—305 9 Claims



1. A battery operated hydraulic vehicle comprising:

a DC drive motor adapted to drive a hydraulic for operating a vehicle,

a battery source adapted to be directly connected across said DC motor at full battery DC potential for operating said motor at full speed at all times,

a hydraulic transmission and hydraulic pump directly connected to and driven by said drive motor,

at least one hydraulic motor connected to said hydraulic transmission for driving said vehicle either in a forward or reverse direction,

an auxiliary hydraulic motor fluidly connected to said hydraulic pump, and

a charging device mechanically driven by said auxiliary hydraulic motor and electrically connected to said battery source for continuously charging said battery source during the use of the vehicle.

4,413,699

MOTORCYCLE

Bruce D. Omholt, 2117 Richmond, NW., Grand Rapids, Mich. 49504

Filed Jun. 2, 1980, Ser. No. 155,611
Int. Cl.³ B62K 11/04
U.S. Cl. 180—219 2 Claims

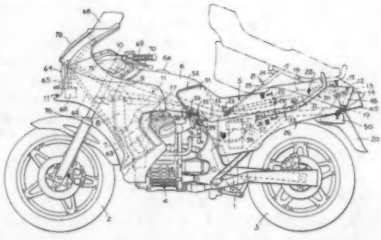
1. In a two-wheeled vehicle having a front wheel, a rear wheel and an engine, the improvements comprising: frame means comprising a forward frame section, an intermediate frame section and a rear frame section, all of said frame sections providing a rigid integral frame for said vehicle and characterized in that the top of said intermediate frame section lies substantially below the tops of said other frame sections; means mounting said front wheel to said forward frame section; means mounting said engine to said forward frame section; foot rest means mounted for supporting the feet of a rider in a forward position relative to the knee of the rider and adjacent the forward frame section to define a link angle at the knee of approximately 110° or greater; means for mounting said rear wheel to said rear frame section; rider seat means having a seat portion and a backrest portion, said seat portion being mounted directly above said intermediate frame section, and said backrest portion extending upwardly and rearwardly for supporting the lumbar region of a rider at an angle substantially in the range of 15°–30° relative to the vertical; a passenger seat mounted to said rear frame section above the elevation of said seat portion of said rider seat means; and an upper support module slidably supported on the upper portion of said rear frame section and adapted for movement between a forward position in which said module covers said passenger seat and the forward portion of said module supports the thoracic region of the rider, and a rear position in which said passenger seat is exposed and a passenger may be accomodated between the thoracic region of the rider and the front end of the module such that the abdominal area of the passenger supports the thoracic region of the rider and the forward portion of said module supports the lumbar region of the passenger seated on said passenger seat.

4,413,700

SEAT MOUNTING STRUCTURE FOR MOTORCYCLES AND ASSOCIATED METHODS

Koji Shiratsuchi, Asaka, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 17, 1981, Ser. No. 303,074
Claims priority, application Japan, Sep. 17, 1980, 55/128003; Sep. 17, 1980, 55/131214[U]; Sep. 17, 1980, 55/131215[U]; Sep. 17, 1980, 55/131223[U]
Int. Cl.³ B62J 1/04, 17/00
U.S. Cl. 180—219 33 Claims



1. In a motorcycle having a frame, front and rear wheels on said frame, an engine between said wheels, and a driver's seat on said frame, the improvement comprising coupling means between said seat and said frame for providing pivotal movement of said seat between a raised inoperative position and a lowered operative position, resilient means for urging said seat to said raised position, releasable holding means for holding the seat in said lowered position, said coupling means including a hinge on said seat, said frame including a guide means movably receiving said hinge for travel between a first forward position and a second rearward position, said seat being held by said releasable holding means with said hinge in said first position and being released from said holding means with said hinge moved to said second position whereupon said resilient means moves said seat to said raised position whereby said seat is raised only after the hinge has been moved in said guide means to said second position.

4,413,701
TRANSMISSION WITH OFFSET DIFFERENTIAL AND DEEP WIDE GROOVE RADIAL BALL BEARING SUPPORTING INTERMEDIATE SHAFT

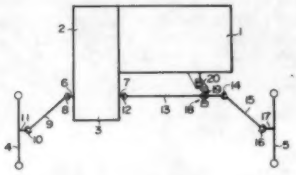
Tadanobu Kumagai, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Nov. 27, 1981, Ser. No. 325,195

Claims priority, application Japan, Dec. 25, 1980, 55-186867[U]

Int. Cl.³ B60K *17/30*

U.S. Cl. 180—256 **5 Claims**



1. In a vehicle comprising a fixed member and two axially opposed driven wheels, a transmission comprising:

(a) two drive shafts of equal length, each flexibly drivingly coupled at its outer end to one of said wheels;

(b) a differential axially located closer to a first one of said wheels and farther from the other one of said wheels, comprising: (b1) a first power output shaft extending towards said first wheel and flexibly drivingly coupled at its outer end to the inner end of the one of said drive shafts whose outer end is drivingly connected to said first wheel; and (b2) a second power output shaft extending towards said other wheel;

(c) an intermediate shaft, flexibly drivingly coupled at its inner end to the outer end of said second power output shaft, and flexibly drivingly coupled at its outer end to the inner end of the other of said drive shafts whose outer end is drivingly connected to said other wheel;

(d) a bracket, mounted at its one end to said fixed member; and

(e) a deep groove radial ball bearing comprising an inner race formed with a inner race groove, an outer race formed with an outer race groove, and a plurality of balls of substantially equal diameters running in said inner race groove and in said outer race groove; said outer race being fixedly mounted to the other end of said bracket, and said inner race supporting an outer part of said intermediate shaft and being fixedly mounted thereto; the cross sections of said inner race groove and of said outer race groove being approximately part circular; and the radius of said cross section of said inner race groove being approximately 0.52 times the diameter of said balls, while the radius of said cross section of said outer race groove is approximately 0.60 times the diameter of said balls.

4,413,702
VEHICLE CONTROL SAFETY SYSTEM

Samuel L. Schlanger, Wayne, N.J., assignor to Gail B. Mauer, Beverly Hills, Calif. and Ellen R. Cohen, Wayne, N.J., a part interest

Continuation-in-part of Ser. No. 216,419, Dec. 15, 1980. This application Apr. 8, 1982, Ser. No. 366,714

The portion of the term of this patent subsequent to Mar. 13, 1996, has been disclaimed.

Int. Cl.³ B60R *21/00*

U.S. Cl. 180—274 **9 Claims**

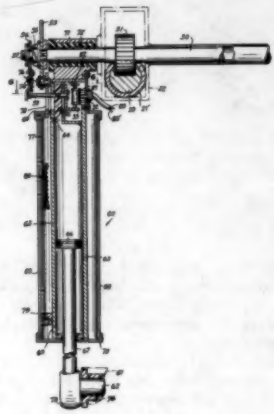
1. A safety system for a vehicle having a chassis, including two parallel spaced-apart chassis legs, and an axle assembly for each of the vehicle wheels, comprising:

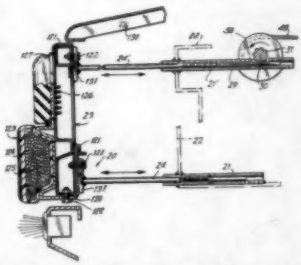
a suspension assembly including at least one air piston arrestor pivotably coupled between said chassis and one of said axle assemblies;

means for arresting said air piston arrestor in a relatively rigid, non-compressible state;

electromechanical means for activating said arresting means; and

at least one bumper assembly including a short stroke retractable bumper slidably mounted on said chassis for movement between a normal, extended position and a retracted position, said bumper assembly including a pair of generally parallel, spaced-apart hollow support arms, each of which is mountable on one of said chassis legs at one end thereof, and a pair of generally parallel, spaced-apart rods, each of which is telescopically received in one of said hollow support arms.





4,413,703
BASS-REFLEX TYPE SPEAKER SYSTEM

Harumitsu Kato, Hachioji; Hironori Yamada, Hidaka; Kaoru Yamazaki, Akigawa; Masashi Maruyama, Iruma, and Takashi Ogasawara, Seki, all of Japan, assignors to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 12, 1982, Ser. No. 357,654

Claims priority, application Japan, Mar. 16, 1981, 56-37443

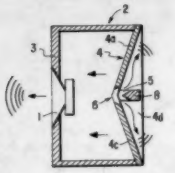
Int. Cl.³ H05K *5/00*

U.S. Cl. 181—156 **6 Claims**

1. In a bass-reflex type speaker system having a cabinet including a front baffle board, a back panel and two side panels and a speaker mounted on the front panel, the improvement comprising

the back panel having a generally triangular cross-sectional

configuration where the apex of the triangle is directed toward the speaker; and



a port disposed in said back panel at the apex of the triangle and a duct in communication with said port where the port is positioned directly behind the speaker.

4,413,704

ELLIPTICIZED ACOUSTICAL LIQUID FILLED LENS PROVIDING BALANCED ASTIGMATISM

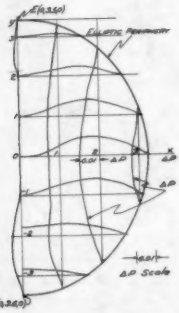
Robert L. Sternberg, Noank, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation of Ser. No. 138,013, Apr. 7, 1980, which is a continuation-in-part of Ser. No. 949,711, Oct. 10, 1978, Pat. No. 4,224,626. This application Mar. 25, 1982, Ser. No. 362,004

The portion of the term of this patent subsequent to Sep. 23, 1997, has been disclaimed.

Int. Cl.³ G10K *11/00*

U.S. Cl. 181—176 **1 Claim**



1. An ellipticized singlet azimuth versus elevation optimized and aperture extremized nonspherical acoustic lens is a liquid filled lens with surfaces S and S′ specified by the partial differential equations

$$S: \frac{\partial z}{\partial x} = F(A)\frac{\partial z}{\partial y} = G(A),$$

$$S': \frac{\partial(z',y')}{\partial(x,y)} = F(A)\frac{\partial(x',y')}{\partial(x,y)}, \frac{\partial(x',z')}{\partial(x,y)} = G(A)\frac{\partial(x',y')}{\partial(x,y)},$$

the symmetry conditions $z(-x,y) = z(x,y)$, $z'(-x',y') = z'(x',y')$, $z(x,-y) = z(x,y)$, $z'(x',-y') = z'(x',y')$,

and the boundary conditions $z(x,y) = z'(x,y) = 0$,

on the ellipse Γ: $(x^2/b_o^2\cos^2\psi_o) + (y^2/b_o^2) = 1$

where

S and S′ are the lens surfaces having functional representations of the forms $z=z(x,y)$ and $z'=Z'(x',y')$ wherein x′ and y′ are themselves functions $x'=x'(x,y)$ and $y'=y'(x,y)$ of the independent variables x and y,

$$\frac{\partial z}{\partial x} \text{ and } \frac{\partial z}{\partial y}$$

are the partial derivatives of z with respect to the independent variables x and y respectively,

$$\frac{\partial(z',y')}{\partial(x,y)}, \frac{\partial(x',y')}{\partial(x,y)} \text{ and } \frac{\partial(x',z')}{\partial(x,y)}$$

are the Jacobian of z′ and y′ with respect to the independent variables x and y, the Jacobian of x′ and y′ with respect to the independent variables x and y and the Jacobian of x′ and z′ with respect to the independent variables x and y respectively, F(A), G(A), F′(A) and G′(A) are the functions of the arguments $A=(x,y,z,x',y',z')$ defined as

$$F(A) = \frac{n_o(x'-x)p - xp'}{(z-z_o)p' - n_o(z'-z)p},$$

$$G(A) = \frac{n_o(y'-y)p - (y-y_o)p'}{(z-z_o)p' - n_o(z'-z)p},$$

$$F'(A) = \frac{n_o(x'-x)}{p'\cos\psi_o - n_o(z'-z)},$$

$$G'(A) = \frac{n_o(y'-y) + p'\sin\psi_o}{p'\cos\psi_o - n_o(z'-z)},$$

and where p and p′ denote the path length elements defined by the expressions

$$p^2 = x^2 + (y-y_o)^2 + (z-z_o)^2, p'^2 = (x'-x)^2 + (y'-y)^2 + (z'-z)^2,$$

and n_o, y_o, z_o and ψ_o are respectively, the index of refraction of the lens material, the y and z coordinates of the finite focal point F and the off-axis angle to the infinite focal point F_∞, Γ is the ellipse bounding the lens formed by S and S′ and is defined by the equation shown in which x and y are the independent variables and b_o is the maximum radius of the lens formed by S and S′ and the semi-major axis of the ellipse Γ.

4,413,705

EXHAUST MUFFLER FOR A TWO-CYCLE OPPOSED CYLINDER ENGINE

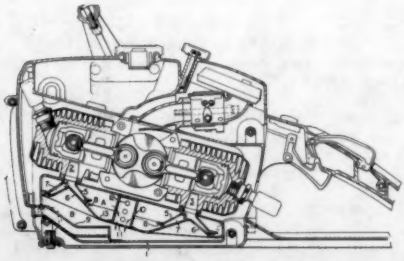
Hisashi Inaga, Tokyo, and Takashi Fukuoka, Fuchu, both of Japan, assignors to Kioritz Corporation, Japan

Filed Dec. 2, 1981, Ser. No. 326,774

Claims priority, application Japan, Dec. 25, 1980, 55-185649[U]

Int. Cl.³ F01N *1/08*

U.S. Cl. 181—240 **1 Claim**



1. In a two-cycle opposed cylinder engine of simultaneous

ignition type having two cylinders arranged to oppose each other in the horizontal direction, said cylinders having exhaust ports arranged in a side-by-side relation,

an exhaust muffler comprising conical members disposed opposed to respective exhaust ports to form conical annular discharge passages leading from said exhaust ports,

said conical annular discharge passages having outlets of different opening areas and opening to a common first diffusion chamber,

a partition wall having an aperture, said partition wall defining an interference chamber disposed near the center of said first diffusion chamber, and

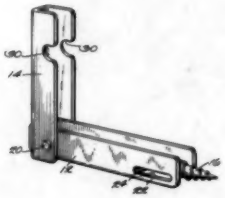
a second diffusion chamber with which said first diffusion chamber communicates through said interference chamber and said aperture.

4,413,706

TREE STEP

Bayard H. Michael, Milwaukee, Wis., assignor to Total Shooting Systems, Inc., North Fond du Lac, Wis.

Filed Dec. 8, 1980, Ser. No. 213,931
Int. Cl.³ A63B *27/00, 29/04*
U.S. Cl. 182—91 **11 Claims**



1. A device to be affixed to a tree comprising an L-shaped bracket having an upstanding support leg member and a horizontal step member and a screw pivotally connected to the upper end of the leg member to attach the bracket to a tree or the like, the improvement comprising,

said screw being pivotally connected to the leg member for movement through about 270° from an inactive position in which the screw is parallel to the leg member and points toward said step member to an extended position in which it is generally parallel to and points away from the leg member and then to an active position in which it projects from the leg member at about 90°,

said step member being connected to the leg member for limited pivotal movement between a position in which the members are generally at about 90° to each other and a folded position in which the members are parallel,

means preventing pivotal movement of the screw relative to the leg member when the members are in said folded position,

said screw lying between the members when the screw is in its inactive position and the members are in said folded position.

4,413,707

SUSPENDED CHAIN SCAFFOLDING EMPLOYING ADJUSTABLE POSTS WITH CHAIN THREADED THERETHROUGH

Robert W. Lienhard, Sr., Pittsburgh, Pa., assignor to Swiss Fabricating, Inc., Pittsburgh, Pa.

Filed May 28, 1981, Ser. No. 267,808
Int. Cl.³ E04G *3/10*
U.S. Cl. 182—150 **7 Claims**

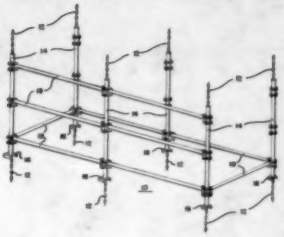
1. A scaffolding arrangement comprising:

a plurality of vertically extending chains;

a support plate engaging each chain at a selected height;

a vertical elongated post disposed around each chain and supported by an associated support plate;

a plurality of vertically spaced apart horizontal members interconnecting said hollow vertical posts; and,



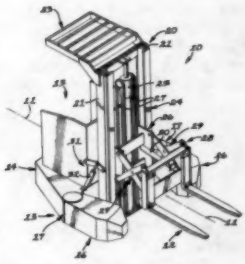
connecting means for connecting each horizontal member to its associated vertical posts for supporting the horizontal member and preventing pivotal movement around its associated vertical posts.

4,413,708

INDUSTRIAL TRUCK WITH PIVOTAL FRONT FRAMES

Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 5, 1982, Ser. No. 355,052
Int. Cl.³ B66B *9/20*; B62D *57/00*
U.S. Cl. 187—9 R **6 Claims**



1. A vehicle (10) disposed on a longitudinal axis (11) thereof comprising:

a rear frame (14),

at least one ground-engaging rear wheel (18) mounted beneath said rear frame (14),

a pair of laterally-spaced front frames (16),

at least one ground-engaging front wheel (19) mounted beneath each of said front frames (16),

pivot means (17) for pivotally mounting each of said front frames (16) forwardly on said rear frame (14) for pivotal movement towards and away from said axis (11), said pivot means (17) having a pivot shaft (33) secured to each of said front frames (16) and an actuating means (38) for selectively rotating said pivot shaft (33), and

drive means (46) for rotating each of said front and rear wheels (18,19), said drive means (46) including an idler sprocket (88) rotatably mounted on said pivot shaft (33) and flexible drive means (91,92) for drivingly interconnecting a said idler sprocket (88) with each of said front wheels (19).

4,413,709

CONSTANT-SPEED CONVEYOR APPARATUS

Ozawa Kazumi, Koga, and No Shinichiro, Hooya, both of Japan, assignors to Kabushiki Kaisha Yakult Honsha, Tokyo, Japan

PCT No. PCT/JP80/00194, § 371 Date Apr. 13, 1981, § 102(e) Date Apr. 13, 1981, PCT Pub. No. WO81/00553, PCT Pub. Date Mar. 5, 1981

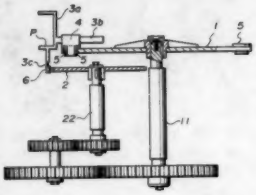
PCT Filed Aug. 22, 1980, Ser. No. 253,757

Claims priority, application Japan, Aug. 24, 1979, 54-107177

The portion of the term of this patent subsequent to Feb. 1, 2000, has been disclaimed.

Int. Cl.³ B65G 17/16

U.S. Cl. 198—344 3 Claims



1. An apparatus for conveying articles along a conveying locus or path of a predetermined path comprising:

a rotary disk having a plurality of bearings mounted on the outer periphery thereof and having a first rotating shaft for rotating said disk;

a plurality of article support means each including an arm, a frame for holding said article and a connecting member;

a freely rotatable shaft mounted on each one of said bearings, said arm of said article support means being arranged to be slidably fitted into each respective rotatable shaft;

a conveyor means arranged to be moved along a predetermined locus controlled by inner and outer guides;

said connecting member being connected to said conveyor;

a sprocket means having a second rotating shaft and adapted to drive said conveyor; and

said first rotating shaft of said rotary disk being arranged to rotate in synchronism with said second rotating shaft of said sprocket means.

4,413,710

RETRACTABLE PANTOGRAPH FOR DOWNWARD WITHDRAWAL IN THE EVENT OF AN ABNORMAL FRONTAL LOAD

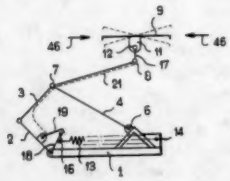
Andre Milleville, Ezanville, France, assignor to Faiveley S.A., Saint Ouen, France

Filed Jun. 10, 1981, Ser. No. 272,343

Claims priority, application France, Jun. 18, 1980, 80 13487

Int. Cl.³ B60L 5/12

U.S. Cl. 191—70 7 Claims



1. A retractable pantograph for automatic downward withdrawal in the event of an abnormal frontal load, comprising a frame, a lifting structure pivotably attached to the frame, a lifting spring connected to the lifting structure for urging a top region of the lifting structure away from the frame, means for connecting a current-collector bow to the top region of the lifting structure, said connecting means including means for permitting displacement of the bow independently of the movable structure, means for neutralizing the lifting spring, additional transmission means for coupling the bow-displacement means to said means for neutralizing the lifting spring, and a load limiter which inhibits the bow-displacement means at point below a predetermined threshold value of the load applied to the bow and which trips said bow with respect to said lifting structure above said threshold value.

4,413,711

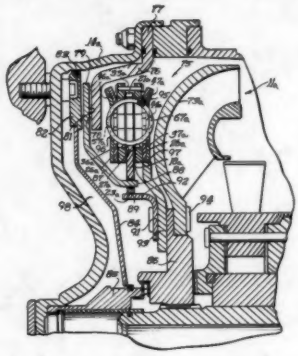
EXTENDED TRAVEL DAMPER IN A LOCK-UP CLUTCH FOR A TORQUE CONVERTER

Paul E. Lamarche, Utica, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Mar. 30, 1981, Ser. No. 248,778

Int. Cl.³ F16H 45/02; F16D 3/14

U.S. Cl. 192—3.28 14 Claims



1. A torsional vibration damper assembly for a lock-up clutch in a torque converter wherein said damper assembly is located adjacent the periphery of the turbine within the torque converter housing, said vibration damper assembly comprising an annular hub plate having a plurality of circumferentially equally spaced radially extending arms, a torque input member operatively connected to said hub plate, a pair of annular retainer plates axially spaced apart to receive said hub plate therebetween, a first floating equalizer formed of a pair of annular plates axially spaced apart and secured together to receive said retainer plates therebetween, a second floating equalizer formed of a pair of annular plates axially spaced apart and secured together to receive said first equalizer therebetween, said retainer plates having a plurality of elongated arcuate windows therein separated by radial spokes, three spring sets received in each window, and a pair of spring separators received in each window to separate said three spring sets, each of said pair of separators being operatively connected to the alternate floating equalizers, and means operatively connecting said retainer plates to the turbine.

4,413,712

DEVICE FOR LOCKING AN ELEMENT IN A STATIONARY POSITION FOR AN AUTOMOBILE VEHICLE

Jackie Richard, Bezons, France, assignor to Regie Nationale des Usines Renault, France

Filed Feb. 10, 1981, Ser. No. 233,528

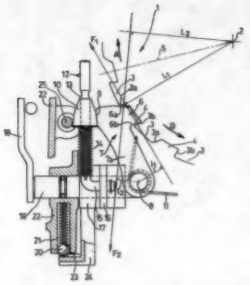
Claims priority, application France, Feb. 12, 1980, 80 03077

Int. Cl.³ B60K 67/00

U.S. Cl. 192—4 A 6 Claims

1. A device for locking the driving wheels of an automobile

in a stationary position comprising a rotary mechanical element adapted to be coupled with the driving wheels of a vehicle for locking those driving wheels when said rotary mechanical element is locked, said rotary mechanical element having a plurality of peripheral notches; and a locking device including a locking finger member and means for pivotably mounting said locking finger member for pivoting between an engaged position, in which said locking finger member engages one of the peripheral notches of said rotary mechanical element to lock said rotary mechanical element, and a disengaged position, in which said locking finger member is withdrawn from the notches of said rotary mechanical element; said locking finger member, when in the engaged position with said rotary



mechanical element coupled to the driving wheels of a vehicle, being urged toward the disengaged position by rotational torque resulting from the weight of the vehicle; in the engaged position said locking finger member and one of the notches of said rotary mechanical element contacting each other on inclined contact surfaces; said contact surfaces being asymmetric with respect to a radius of said rotary mechanical element such that the inclinations of said contact surfaces result in the torque exerted by rotation of said rotary mchanical element and transmitted by said contact surfaces, to urge said locking finger member toward the disengaged position, being substantially the same for each rotational direction of said rotary mechanical element.

4,413,713

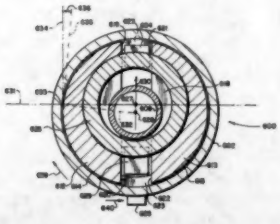
TORQUE TRANSMITTING AND BLOCKING DEVICE

Joe E. West, 141 N. Oak Trail, Coppell, Tex. 75019

Continuation-in-part of Ser. No. 841,809, Oct. 13, 1977, Pat. No. 4,236,618. This application Nov. 21, 1980, Ser. No. 209,011

Int. Cl.³ F16D *67/00*

U.S. Cl. 192—8 R **22 Claims**



1. Apparatus for selectively transmitting torque from a torque input means to a torque output means, and for blocking transmission of torque from said output means to said input means, comprising:

a drum having a cylindrical inner surface;

a pair of shoes positioned within said drum, each of said shoes having an arcuate surface bearing against the inner surface of said drum;

a spanner ring extending between said shoes and engaging their inner surfaces at least at points lying on the same side of the axis of said drum, said spanner ring being so positioned with respect to the drum axis that a perpendicular struck from its effective centerline at the intersection of the centerline with the inner drum surface forms an angle with a drum inner surface tangent struck from the same point which is in the lock angle range for the materials employed to form the drum and shoe surfaces;

said shoes being displaceable toward each other at their ends lying on the side of the drum axis opposite their points of engagement with said spanner ring;

said shoes having among them at least two force transmitting surfaces oriented generally radially of said drum;

force transmitting means engagable with each of said surfaces;

one of said force transmitting surfaces being oriented such that a force applied generally orthogonally therethrough by said force transmitting means sets both of said shoes in jamming relationship with the inner surfaces of said drum; and

the other of said force transmitting surfaces being oriented such that a force applied generally orthogonally therethrough by said force transmitting means slidingly rotates said shoes within said drum without jamming thereagainst.

4,413,714

CLUTCH CONTROL SYSTEM

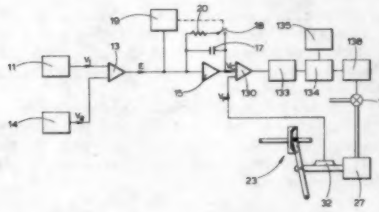
Harry M. Windsor, Harbury, England, assignor to Automotive Products Limited, Leamington Spa, England

Filed Jun. 30, 1981, Ser. No. 279,084

Claims priority, application United Kingdom, Jul. 8, 1980, 8022347

Int. Cl.³ B60K *41/02*

U.S. Cl. 192—0.033 **5 Claims**



1. A vehicle transmission clutch electronic control system comprising:

an engine speed sensor;

means for producing an electrical engine speed signal representative of engine speed and derived from the sensor;

generator means for producing an electrical reference signal;

comparator means arranged to receive and compare said engine speed and reference signals and produces a consequent error signal;

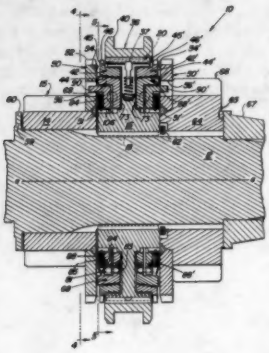
an integrator which receives the error signal and has a capacitor with a switch means for causing the error signal to bypass said capacitor, or not, depending upon the state of the switch means, the state of said switch means being dependent upon the value of said error signal so that the integrator has two response modes to the error signal for consequent production of a command signal;

a clutch actuator that operates the clutch, and a control means responsive to the command signal and controlling the actuator.

4,413,715
SELF-ENERGIZED SYNCHRONIZER

Richard A. Michael, Waterloo; Dalsang K. Chaudhari, Cedar Falls, and Gordon L. Marquart, Jesup, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Nov. 13, 1981, Ser. No. 321,139
Int. Cl.³ F16D *23/06*
U.S. Cl. 192—53 F **21 Claims**



1. In a self-energized synchronizer for synchronizing first and second members rotatable about a common axis, said synchronizer including: a body member fixed to said first member for rotation therewith having a toothed outer circumference, a shifter collar having a toothed inner surface engaging said toothed outer circumference of said body member and movable axially thereon, a blocking ring positioned adjacent to said body member and movable axially thereto having a toothed outer surface, a friction surface, and abutment means for limiting relative rotation between said body member and said blocking ring, a drive collar secured to said second member for rotation therewith having a toothed outer surface, the improvement comprising:

(a) self-energized means rotatable with said drive collar and frictionally engageable by said friction surface of said blocking ring for transferring frictional torque between said first and second members and responsive to such torque transfer to expand; and

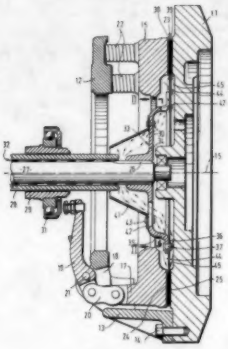
(b) a frictional member carried on said body member and acting between said drive collar and said self-energized means for resisting relative rotation between said first and second rotatable members upon expansion of said self-energized means.

4,413,716
FRICTION CLUTCHES

Thomas B. Newsome, and Garry Fulford, both of Sheffield, England, assignors to Laycock Engineering Limited, Sheffield, United Kingdom

Filed Jan. 29, 1981, Ser. No. 229,762
Claims priority, application United Kingdom, Feb. 19, 1980, 8005519
Int. Cl.³ F16D *13/72, 13/74*
U.S. Cl. 192—70.12 **3 Claims**

1. A friction clutch comprising a rotary driving member; a friction face on the rotary driving member; a pressure member which is rotatable with the driving member and can be urged towards the driving member; a friction face on the pressure member; a driven member disposed between the driving and pressure members; friction faces on the driven member for engagement with the friction faces of the driving and pressure members so that the latter members can drive the driven member frictionally through a first interface defined by the friction face of the driving member and one friction face of the driven member and a second interface defined by the friction face of the pressure member and the other friction face of the driven member; fluid supply means for supplying fluid to the friction faces of the driven member for cooling and lubrication of the faces, fluid from said supply means being flung outward in use by centrifugal force to the friction faces; characterized by the provision of means for dividing the fluid in controlled proportions between the two interfaces, said means comprising a generally bell shaped distribution member connected to said

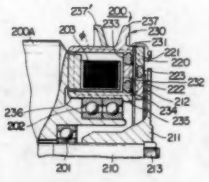


driven member for rotation therewith; a first passage leading outward to one interface; a second passage leading outward to the other interface; and apertures in the distribution member adjacent its connection with said driven member, said apertures facing generally radially outwardly and leading to said first passage so that some of said fluid passes through them into said first passage, the remainder of said fluid entering said second passage from the end of said distribution member.

4,413,717
ELECTROMAGNETIC CLUTCH AND METHOD OF MANUFACTURE

Hisanobu Kanamaru, Katsuta; Hideo Tatsumi, Mito; Kosaku Sayo, Katsuta, and Moisei Okabe, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 20,316, Mar. 14, 1979, Pat. No. 4,305,198.
This application Jun. 29, 1981, Ser. No. 278,728
Claims priority, application Japan, Mar. 27, 1978, 53-34193
Int. Cl.³ F16D *27/10, 27/14*
U.S. Cl. 192—84 C **5 Claims**



1. An improved electromagnetic torque transmission clutch including first and second rotatable members disposed in substantially coaxial relationship, said first rotatable member being drivingly connected to a driven member and including a section made of a magnetizable material, said second rotatable member including a section made of a magnetizable material and provided with means for drivingly connecting said second rotatable member to a driving means, and one of said rotatable members being axially movable into face-to-face contact with the other of said rotatable members; means including said sections of said first and second rotatable members for forming

a magnetic circuit; and an electromagnetic coil means for generating a magnetic flux passing through said magnetic circuit; wherein at least one of said first and second rotatable members comprises substantially concentric and radially spaced annular members both made of a magnetizable material, said annular members having radially opposed connecting surfaces formed therein with radially opposed annular grooves therein, each of said grooves being defined by a bottom and axially spaced side walls that are each inclined at an angle relative to a plane that is perpendicular to a rotation axis of said transmission clutch and an annular bond member of a non-magnetizable metal swaged into the annular space between said concentric magnetizable members and into said annular grooves to mechanically connect them together and magentically disconnect them from each other whereby said concentric magnetizable members are restrained not only in the radial direction but also in the axial direction, said bond member being formed with an annular recess in that side which is directed to and engaged by the other of the first and second rotatable members.

4,413,718

METHOD AND APPARATUS FOR DETECTING THE PRESENCE OF A COIN IN A PASSAGEWAY

Robert Dean, Slough, England, assignor to Mars, Inc., McLean, Va.

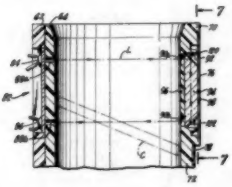
PCT No. PCT/GB80/00054, § 371 Date Nov. 26, 1980, § 102(e) Date Oct. 29, 1980, PCT Pub. No. WO80/02081, PCT Pub. Date Oct. 2, 1980

PCT Filed Mar. 26, 1980, Ser. No. 212,714

Claims priority, application United Kingdom, Mar. 26, 1979, 7910550

Int. Cl.³ G07D 9/00

U.S. Cl. 194—1 K **14 Claims**



10. A method of detection of a coin in a predetermined plane substantially transverse to the coin path of a coin which moves freely through a nearly vertical coin passageway of a coin mechanism, the method comprising the steps of:

directing a light beam in a first line from a first point in the predetermined plane located on one side of the coin passageway to a second point in the predetermined plane located on the other side of the coin passageway,

reflecting the light beam from the second point to a third point in the predetermined plane located on the same side of the coin passageway as the second point,

reflecting the light beam in a second line from the third point to a fourth point in the predetermined plane located on the same side of the coin passageway as the first point, and

detecting the interruption of the light beam, the first line and the second line being spaced from one another and from the nearest of the sides of the coin passageway by distances which are less than the size of the smallest coin which is to be detected whereby the beam of light is always interrupted by the passage of the smallest coin.

4,413,719

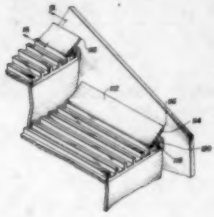
METHOD AND APPARATUS FOR ENTRAPMENT PREVENTION AND LATERAL GUIDANCE IN PASSENGER CONVEYOR SYSTEMS

Carl J. White, 5000 SW. 80th St., Miami, Fla. 33143

Filed May 28, 1981, Ser. No. 268,022

Int. Cl.³ B66B 9/12

U.S. Cl. 198—333 **27 Claims**



1. In a passenger conveyor for continuously conveying passengers along a path of travel extending between two landings at respective opposite ends of the conveyor, which includes drive means and an endless series of rigid articulated passenger platforms which are continuously moved in sequence along the path of travel by the drive means, a guidance system for laterally guiding each platform moving along said path of travel, which comprises:

two stationary skirt panels which extend between the two landings adjacent respective opposite lateral sides of the platforms being moved along said path of travel and which respectively include two smooth, planar, inwardly-facing, bearing surfaces of a first material disposed in respective parallel vertical planes extending along said path of travel; and

said series of platforms, each platform including two smooth, planar, outwardly-facing bearing surfaces of a second material disposed on respective lateral sides of the platform in parallel vertical planes extending along said path of travel, the bearing surfaces of each platform moving along said path of travel being disposed in sliding contact with respective adjacent skirt panel bearing surfaces.

4,413,720

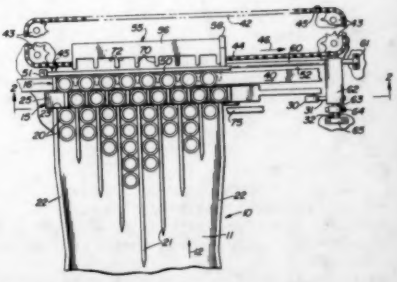
ARTICLE HANDLING APPARATUS

Frederick W. Pfleger, 27 Cherry Ave., Maple Shade, N.J. 08052

Filed Sep. 4, 1981, Ser. No. 299,300

Int. Cl.³ B65G 47/00

U.S. Cl. 198—345 **7 Claims**



1. Article handling apparatus comprising a generally horizontal feed conveyor, a plurality of longitudinal guides along and subdividing said feed conveyor into channels for passing

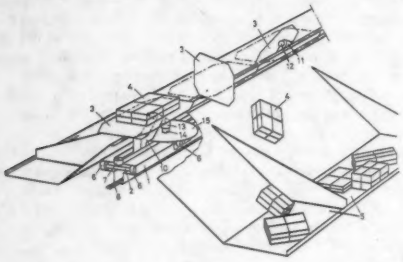
aligned rows of articles and terminating at a station, a gate extending transversely of said feed conveyor at said station and generally coplanar with said feed conveyor to receive and support a transverse row of articles from said station, a removal conveyor extending along said gate generally coplanar therewith for receiving and removing a transverse row of articles, and means for shifting said gate upwardly while supporting a transverse row of articles to block the next upstream transverse row of articles at said station for operating on said blocked articles.

4,413,721

SORTING CONVEYOR FOR INDIVIDUAL OBJECTS

Willy Bollier, Goldau, Switzerland, assignor to Daverio A.G., Zurich, Switzerland

PCT No. PCT/CH80/00140, § 371 Date Jul. 31, 1981, § 102(e) Date Jul. 31, 1981, PCT Pub. No. WO81/01999, PCT Pub. Date Jul. 23, 1981
PCT Filed Nov. 17, 1980, Ser. No. 287,742
Claims priority, application Switzerland, Jan. 4, 1980, 38/80
Int. Cl.³ B65G *47/46*
U.S. Cl. 198—365 2 Claims



1. Sorting conveyor for individual objects having a plurality of carts circulating along an endless track, each cart carrying a load bearing tray for the conveyed objects, said tray being tiltable from the horizontal position in both directions into an inclined position at predetermined discharge locations by guidance means arranged along the track, said conveyor being characterized in that each said load bearing tray is supported from below by a support shaft which extends diagonally to the load bearing tray surface, said support shaft being rotatably journalled within a bearing fixedly attached to said cart, in that a drive disc mounted on a vertical shaft is rotatably journalled upon the cart, said vertical shaft being in drive connection with said support shaft of the load bearing tray by means of a universal joint, and in that said guidance means at said discharge locations are so constructed as to be capable of rotating said drive disc, thereby to tilt said load bearing tray.

4,413,722

ARTICLE ORIENTATION DEVICE

Donald Frisbie, R.R. 1, Northfield, Minn. 55057; Larry D. Frisbie, Bricelyn, Minn. 56014, and Joel J. Olson, 2836 Blackstone, St. Louis Park, Minn. 55416

Filed Aug. 19, 1981, Ser. No. 294,330
Int. Cl.³ B65G *47/24*
U.S. Cl. 198—392 17 Claims

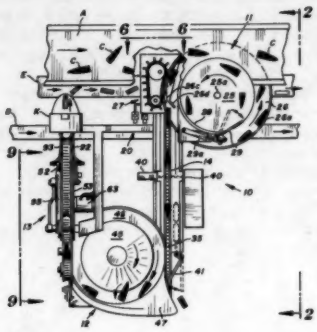
1. An article orientation device particularly for delivering tapered articles such as ears of corn from a conveyor transporting the ears in random fashion to a kernel cutting device with the ears being arranged in a determined orientation, said device including:

a. a pick-off section for receiving and gathering ears of corn from the conveyor;

b. a first conveyor means receiving ears from said pick-off section;

c. a sensing station arranged in position adjacent said first conveyor means to determine the orientation of the ears carried by said conveyor means;

d. an orientation section arranged and constructed to receive ears of corn from said first conveyor means and to selectively rotate the ears in end-to-end relation in response to a signal from said sensing station;



e. second conveyor means receiving the oriented ears of corn from said orientation section and delivering the same to the kernel cutting device; and,

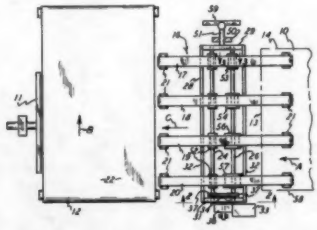
f. said pick-off section including a pair of wheel members arranged in vertical relation to one another, the upper of said wheels being arranged in overlying relation to the supply conveyor to receive ears of corn therefrom and drop the same onto the lower of said wheels.

4,413,723

METHOD AND APPARATUS FOR CONVEYING A SHEET

Walter J. Stobb, Pittstown, N.J., assignor to Stobb, Inc., Clinton, N.J.

Filed Dec. 7, 1981, Ser. No. 328,209
Int. Cl.³ B65G *47/24*
U.S. Cl. 198—415 3 Claims



1. Apparatus for conveying a sheet in a turning action, comprising a set of movably mounted belts extending in one direction and parallel to each other, a driving member disposed adjacent said belts, two shafts rotatably and displaceably disposed in driven rotatable relation to said driving member and extending adjacent said belts and transverse to the direction of the extent of said belts, a set of driving pulleys on each of said shafts for rotation therewith and with one pulley of each of said set being aligned with a respective one of each of said belts, all of said pulleys in said set on one of said shafts being of the same diameter, for driving all of said belts at the same speed when in contact with said belts when said one shaft is displaced into driving relation with said belts, and all of said pulleys in said set on the other of said shafts being of diameters different

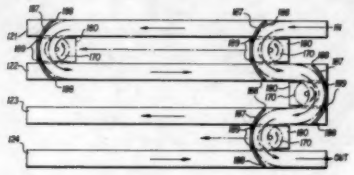
from each other, for driving all of said belts at speeds different from each other when in contact with said belts when said other shaft is displaced into driving relation with said belts.

4,413,724

HORIZONTAL ACCUMULATOR

Theodore F. Fellner, Neenah, Wis., assignor to Mapatent, N.V., Netherlands

Filed May 18, 1981, Ser. No. 264,845
Int. Cl.³ B65G *15/26*
U.S. Cl. 198—594 **4 Claims**



1. A power driven conveyor system for transporting and accumulating a plurality of items along a path of movement from a source to a destination, comprising:

a plurality of horizontally oriented, parallel conveyor belt means for accumulating the plurality of items along the path, said conveyor belt means being arranged so that each of said conveyor belt means moves in a direction opposite to that of an adjacent conveyor belt means;

a plurality of pulley wheel means for moving the plurality of items along the path of movement from each of the conveyor belt means to the adjacent conveyor belt means, each of said plurality of pulley wheel means being arranged between adjacent conveyor belt means; and

a plurality of slide assembly means, each arranged between the adjacent conveyor belt means, for carrying the plurality of pulley wheel means and for extending the length of the path of movement of the plurality of items.

4,413,725

POTTED PLANT PACKAGE

Edward D. Bruno, 1880 S. Monaco Pkwy., Denver, Colo. 80202, and Gary C. Bruno, 3132 S. Norfold St., Aurora, Colo. 80802

Continuation of Ser. No. 280,212, Jul. 6, 1981, abandoned. This application Dec. 6, 1982, Ser. No. 447,205
Int. Cl.³ B65D *85/50, 85/52*
U.S. Cl. 206—45.33 **2 Claims**

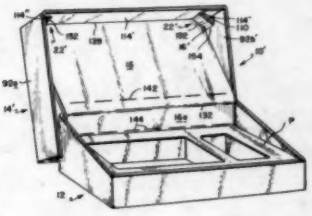
1. A package for a pot containing a plant comprising, in combination, an initially flat decorative sheet, said sheet being of such a flexibility and pliability that it will wrap and form around said pot but will not stay around said pot without additional support, a flexible tubular sleeve made of collapsible material openable into said sleeve, said sleeve being positionable around the pot to snugly encircle said sheet and pot and being the sole means of holding the sheet in position around the pot, portions of said sheet extending upwardly from said sleeve to form a decorative background for the plant, and a message card positioned between said transparent sleeve and said decorative sheet to be held in slideable and retractable position by said sleeve, whereby an attractive plant package is provided, wherein said sleeve has an upper portion for protecting the potted plant such as during shipment and which is removable from the pot in situ and a lower portion which remains around the pot to hold the sheet and card in position, and a ribbon mounted on said card, said card being positionable with the card and ribbon straddling said sleeve, and with the ribbon facing outwardly.

4,413,726

DISPLAY BOX

Thomas L. Davidson, Montville, Conn., assignor to Robertson Paper Box Co., Inc., Montville, Conn.

Filed Jan. 18, 1982, Ser. No. 340,258
Int. Cl.³ B65D *5/66*
U.S. Cl. 206—45.13 **16 Claims**



1. A display box formed from a single material blank, said box comprising

A. a generally rectangular bottom section having bottom, front, rear and side walls and a top opening;

B. a cover

(1) having top, front, rear and side walls and a bottom opening; and

(2) sized slightly larger than the bottom section;

C. a hinge connecting the rear walls of the bottom section and cover so that the cover can swing between

(1) a closed position wherein it engages over and closes the bottom section; and

(2) an open position wherein it extends upwardly rearwardly forming an obtuse angle with the bottom section;

D. a display panel;

(1) positioned in said cover;

(2) extending into the bottom section;

(3) having one end hinged at the junction of the cover top and front walls; and

(4) having an opposite end portion secured against the bottom section rear wall;

E. a first hinge line extending across the display panel and which is opposite and substantially parallel to the upper edge of the bottom section rear wall when the cover is in its open position;

F. a second hinge line extending across the display panel and spaced substantially parallel to the first hinge line so that

(1) when the cover is in its closed position, the panel lies more or less against the inside of the cover top wall; and

(2) when the cover is in its open position, the panel opposite end portion is swung out of the cover so that the panel is substantially flat and angled upwardly so that it helps to establish the open position of the cover and is readily visible to an observer; and

G. means for establishing the closed position of the cover, said establishing means comprising a panel

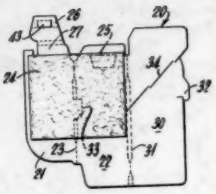
(1) integral with the display panel;

(2) adhered to the inside of the cover front wall; and

(3) having a height less than the height of the cover front wall so as to form a stopper edge which engages the top

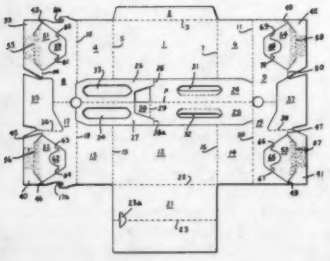
edge of the bottom section front wall when the cover is in its closed position.

4,413,727
FOLDER RETAINER FOR SURGICAL SUTURES
Robert J. Cerwin, Pittstown, and Marvin Alpern, Glen Ridge, both of N.J., assignors to Ethicon Inc., Somerville, N.J.
Filed Mar. 18, 1982, Ser. No. 359,403
Int. Cl.³ A61B *17/06*
U.S. Cl. 206—63.3 **10 Claims**



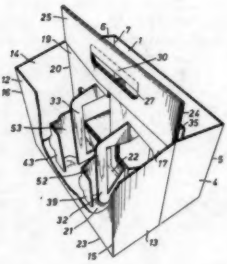
1. A folded retainer for surgical sutures comprising:
(a) first and second suture retaining panels foldably connected along one major edge thereof,
(b) a foam member adhesively secured on facing surfaces of said first and second panels;
(c) one of said first and second panels including a window exposing said adhesive securing the foam to said panel; and
(d) a third panel foldably connected to an edge of the panel not having the window, said third panel being foldable about said edge so as to contact the adhesive exposed in said window.

4,413,728
ARTICLE CARRIER
Prentice J. Wood, Atlanta, Ga., assignor to The Mead Corporation, Dayton, Ohio
Filed Jul. 8, 1982, Ser. No. 396,345
The portion of the term of this patent subsequent to Feb. 12, 1997, has been disclaimed.
Int. Cl.³ B65D *6/48, 75/00*
U.S. Cl. 206—187 **10 Claims**



1. An article carrier comprising a bottom wall, a pair of side walls foldably joined to the side edges of said bottom wall, end wall panels foldably joined respectively to the end edges of said side walls and extending inwardly therefrom, medial partition structure foldably joined to the inner edges of said end wall panels and extending medially inward of the carrier, handle structure secured to said medial partition structure and extending upwardly therefrom, a first pair of transverse partition panels foldably joined to the medial partition structure on each side of the carrier, a second pair of transverse partition panels foldably joined respectively to said first pair of transverse partition panels on each side of the carrier and disposed in overlapping relation therewith, an anchoring tab foldably joined to each of said second pair of transverse partition panels and secured to the inner surface of the associated side wall to form a plurality of article receiving cells on each side of the carrier and characterized in that the distance between said medial partition structure and the adjoining fold line between each of said first and second transverse partition panels is approximately one-fourth the width of each of said end wall panels and in that said second transverse partition panels are struck in part from the associated ones of said first transverse partition panels and of said medial partition structure and wherein the parts of said second transverse partition panels which are struck from said first transverse partition panels respectively constitute approximately one-third of the horizontal dimensions of said second transverse partition panels.

4,413,729
ARTICLE CARRIER
Prentice J. Wood, Hapeville, Ga., assignor to The Mead Corporation, Dayton, Ohio
Continuation of Ser. No. 127,988, Mar. 7, 1980, abandoned. This application Mar. 22, 1982, Ser. No. 360,744
Int. Cl.³ B65D *75/00*
U.S. Cl. 206—188 **4 Claims**

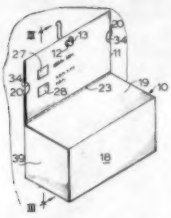


1. A blank for a cellular article carrier comprising a pair of side wall forming panels, end wall panels hinged to opposed end edges of said side wall forming panels, medial panels foldably joined to each of said end wall panels along the edges thereof remote from said side walls, each of said medial panels having struck therefrom a transverse partition forming structure comprising a main transverse partition panel hinged to that medial panel, a supplementary transverse partition panel hinged to said main transverse partition panel and arranged to be folded into overlapping relationship with at least a portion of said main transverse partition panel, and an anchoring tab hinged to said supplementary transverse partition panel, characterized in that said supplementary transverse partition panels and anchoring tabs associated with each of said medial panels are all arranged so as to extend in the same direction toward one and the same end of said blank before being folded and that all of said supplementary transverse partition panels are hinged to said main transverse partition panels so as to be rotated and folded in one and the same direction when the carton is formed.

4,413,730
CARTON-SLIDE CHART
Henry C. Morse, 345 Fullerton Pkwy., Chicago, Ill. 60614
Filed Apr. 14, 1982, Ser. No. 368,467
Int. Cl.³ B65D *69/00*
U.S. Cl. 206—232 **11 Claims**

1. A carton and billboard type of slide chart comprising a one piece relatively stiff cardboard strip having opposite parallel end edges,

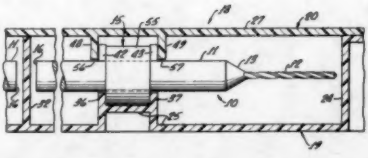
said strip being divided into a plurality of longitudinally aligned sections, said sections including four carton forming panel sections intermediate said end edges, two adjacent slide envelope panel sections adjacent one end adapted to be folded over each other and secured at the open end of the folded section, a two sided glue flap and slide panel section at the other end, said two sided glue flap being adjacent a carton forming panel section and positioned intermediate said slide panel section and said carton forming section, and said slide panel section adapted to be folded and interposed between the folded envelope panel sections so that the envelope panel sections and slide panel section form a slide chart, a transverse slit defining an outer margin of said glue flap, said slit stopping short of one end of said glue flap to form a retainer tab retaining the outer of said sections to said glue flap, to extent between said two end sections and accommodate the gluing of said end sections thereto to form a slide, the slit and retainer tab defining a margin of a slide card adapted to be positioned between said first mentioned folded end sections and form a slide card movable along the edge of said glue flap upon the breaking of said tab, the end section of said slide card visible when the carton is in a normal position having indicia thereon cooperating with windows in said slide and indicia on said slide adjacent said windows to give interesting information, which may be educational or refer to the contents of the carton or trivia interesting to the age of the person using the contents of the carton, upon breaking of said tab and moving said slide card along said slide, and four intermediate sections bent at right angles with respect to each other to form a rectangular carton with the glue flap extending vertically of the rear wall portion of the carton between said first mentioned two end sections to glue said end sections in the form of a slide.



4,413,731
PACKAGING ARRANGEMENT FOR CUTTING TOOLS SUCH AS DRILLS

Allen T. Weideman, North Hollywood, Calif., assignor to Tulon, Inc., Gardena, Calif.

Filed Jul. 7, 1982, Ser. No. 396,109
Int. Cl.[3] B65D 85/28
U.S. Cl. 206—379 12 Claims



1. In combination with a cutting tool having a shank for insertion into the collet of a machine and a portion having a cutting means thereon projecting from one end of said shank, a packaging arrangement for said cutting tool comprising

a plastic collar received on said shank and frictionally retained thereon between the ends thereof;

a first member defining opposed parallel walls having free outer edges and a bottom wall, each of said parallel walls having a slot therein extending inwardly from said free outer edge thereof,

said slots being aligned and being wider than the diameter of said shank,

said shank extending through said slots, and

said collar being positioned intermediate said walls and gripped

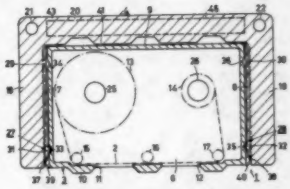
thereby so as to suspend tool above said bottom wall by said collar,

and a second member having means for retaining said shank so received in said slots.

4,413,732
CASSETTE AND ADAPTER COMBINATION

Friedrich Louzil, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 30, 1979, Ser. No. 71,224
Claims priority, application Austria, Sep. 4, 1978, 6386/78
Int. Cl.[3] B65D 85/672
U.S. Cl. 206—387 13 Claims



1. In combination, a cassette for a record carrier in the form of a tape, comprising a cassette housing having two cover walls, two side walls and a front wall having at least one opening, the record carrier tape passing along and being accessible through said opening,

a U-shaped bracket comprising two limbs and one cross piece interconnecting said two limbs, arranged to be detachably connected to the cassette housing by engagement of said two limbs with the two side walls of the cassette housing, and

retaining means acting between the cassette housing and the bracket for retaining the cassette housing and the bracket to each other,

characterized in that the cassette housing and the bracket are arranged to be connectable to each other in a first position relative to each other, in which the front wall of the cassette housing is remote from the bracket cross piece, the cassette-bracket combination thereby being positionable in an apparatus by locating with respect to the bracket, at the same time that the front wall opening is accessible for scanning of the tape; as well as in a second relative position in which the cassette housing front wall faces the bracket cross piece such that the bracket cross piece protects said front wall, and

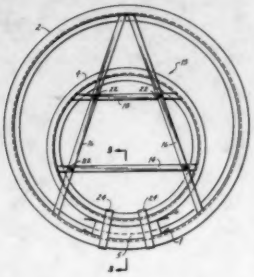
said retaining means comprise at least one double-acting latching device having primary and secondary latching elements arranged on the cassette housing and on the bracket, engageable with each other.

4,413,733

PIPE NESTING DEVICE

J. James Dunn, Brookwood, and Robert M. Graham, Birmingham, both of Ala., assignors to U.S. Pipe and Foundry Company, Birmingham, Ala.

Filed May 3, 1982, Ser. No. 374,573
Int. Cl.³ B65D 85/20; F16L 3/22
U.S. Cl. 206—446 7 Claims



6. A nest of push-on bell and plain end pipes having a retainer groove in the bell of each pipe comprising:

(a) a first and second pipe,

(b) said first pipe being placed inside said second pipe with said bell of said first pipe being displaced substantially axially from said bell of said second pipe,

(c) a first structural member extending across a chord of said bell of said second pipe and having each end of said first structural member extending into said retainer groove of said second pipe,

(d) a second structural member coplanar with said first structural member, said second structural member extending across a diametrically opposite chord of said bell of said second pipe and having each end of said second structural member extending into said retainer groove of said second pipe,

(e) a third structural member extending across said first and second structural members and across a chord of the bell of the first pipe and having each end of said third structural member extending into said retainer groove of said first pipe,

(f) a fourth structural member coplanar with said third structural member, said fourth structural member extending across said first and second structural member and across a diametrically opposite chord of said bell of said first pipe and having each end of said fourth structural member extending into said retainer groove of said first pipe, and

(g) said first structural member being bolted to said third and fourth structural members and said second structural member being bolted to said third and fourth structural members.

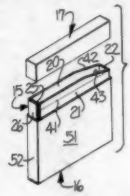
4,413,734

MULTIPLE COMPONENT FILM PACKAGE

Elliott H. Newcombe, Jr., Charlotte, N.C., assignor to Atlantic Coast Carton Company, Charlotte, N.C.

Filed Aug. 11, 1982, Ser. No. 407,259
Int. Cl.³ B65D 5/56, 5/32
U.S. Cl. 206—455 8 Claims

1. A protective storage and dispensing box for flexible sheets of light-sensitive material, such as X-ray film sheets, said box including an inner box component with an open upper end and a closed lower end, an outer box component closely surrounding and engaging said inner box component, said outer box component including an open upper end terminating below the level of the open upper end of said inner box component and a closed lower end, and a cap-type cover including a lower edge adapted to cooperate with the open upper end of said outer box component, said cover surrounding and closing the open upper end portion of said inner box component, said inner box component including rectangular front and rear spaced-apart panels with opposed sides and upper and lower edges, a first side panel including opposed sides joined along fold lines to corresponding sides of said front and rear panels, a second side panel including first and second overlapped panel components, a bottom including first and second overlapped bottom panels joined along fold lines to said front and rear panels, downwardly sloping portions on said upper edges of said front and rear panels of said inner box component, said first side panel of said inner box component including an upper edge positioned at the juncture of said downwardly sloping portions of said upper edges of said front and rear panels of said inner box component, said downwardly sloping portions and said upper edge of said first side panel of said inner box component providing exposure of the corresponding upper corner of the film sheets to thereby aid in the removal of the film sheets from said box, and lines of perforations formed in said front and rear



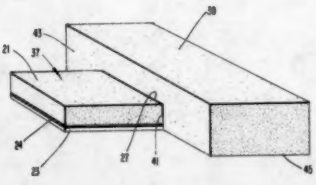
panels of said inner box and spaced below said upper edge of said front and rear panels and at the same level as the upper edge of said first side panel so that the upper portions of said front and rear panels of said inner box may be easily removed to provide access to the entire width of the upper portions of the film sheets packaged in said box, said outer box component including rectangular front and rear spaced-apart panels with opposed sides and upper and lower edges, a first side panel including opposed sides joined along fold lines to corresponding opposed sides of said front and rear panels, a second side panel including first and second overlapped panel components, and a bottom including first and second overlapped bottom panels joined along fold lines to said front and rear panels, said bottom panels of said inner and outer box components being overlapped in the same manner so that said bottom panels are alternately joined by fold lines to said front and rear panels to provide a sinuous path for any light entering the box through the bottom to thereby aid in excluding light from the interior of said box.

4,413,735

EDGE PROTECTOR AND METHOD OF MAKING EDGE PROTECTORS

Thomas J. Little, Kings Hill Rd., Etna, N.H. 03750

Filed Apr. 21, 1981, Ser. No. 256,137
Int. Cl.³ B65D 81/02, 85/30
U.S. Cl. 206—523 13 Claims



1. A protector for an edge of an article comprising:

a first part having a scoring line, said scoring line extending

from a first edge to a second edge of the first part and from a first side surface of the part closely adjacent to a second side surface;

pliable film means on the second side surface of said first part for permitting flexing of said first part along said scoring line;

a second part having a recess in a first side surface which encases a portion of the first part extending from the scoring line; and

means for securing the portion of the first part within the recess in the second part.

4,413,736

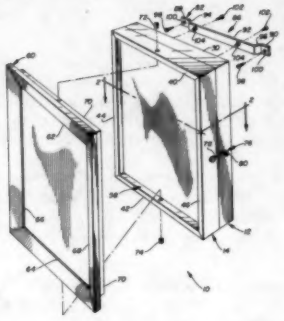
JEWELRY BOX

Jerre L. Nibling, P.O. Box 277, Lavon, Tex. 75066

Filed Mar. 29, 1982, Ser. No. 363,057

Int. Cl.³ A47F *5/08*; A47B *67/02*; B65D *25/10, 5/52*

U.S. Cl. 206—566 **16 Claims**



1. A jewelry box, comprising: container means adapted to enclose jewelry; cover means for preventing access into said container means; means for connecting said cover means to said container means; frame means for providing a supporting border to a representation made on a surface and for permitting a visual observation of the representation; and attaching means for detachably connecting said frame means to said cover means to permit replacement of the representation.

4,413,737

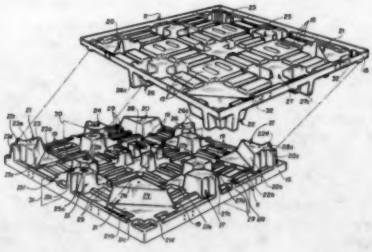
SHIPPING PALLET AND A PACKAGE FORMED THEREFROM

Joseph H. Wind, Taylors, S.C., assignor to Bigelow-Sanford, Inc., Greenville, S.C.

Continuation-in-part of Ser. No. 229,195, Jan. 28, 1981, abandoned. This application Aug. 24, 1981, Ser. No. 295,524

Int. Cl.³ B65D *19/00, 19/38, 21/02*

U.S. Cl. 206—599 **27 Claims**



1. A shipping pallet of the type formed of a single sheet of material and constructed for use with another substantially identical pallet so as to serve as a bottom or top wall of a shipping container for transporting and storing a load, said shipping pallet having a generally planar base and a plurality of foot means projecting from the base, said foot means including corner foot means positioned in respective corner areas of the pallet, central foot means positioned centrally of the pallet, and intermediate foot means positioned between adjacent corner foot means, and wherein each of the foot means comprises at least one projecting member and a platform member adjacent each projecting member, and said projecting members and said platform members being so constructed and arranged relative to each other that the pallet when in use in a predetermined position of orientation, and at least another position of orientation 180° out-of-phase therefrom, may be stacked in mating relation to a substantially identical inverted pallet and with the projecting members abutting the platform members of the inverted pallet and serving to provide a lateral anti-shift interengagement between the adjacent pallets in a plurality of directions.

4,413,738

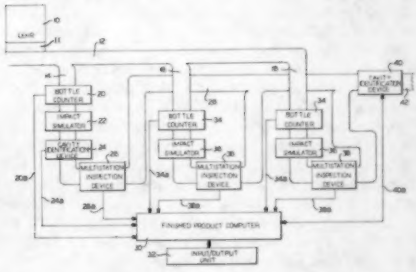
APPARATUS AND METHOD FOR CONTROLLING THE INSPECTION OF FINISHED PRODUCTS

Ernest H. Pemberton, Toledo, Ohio; Darius O. Riggs, Ottawa Lake, Mich.; Douglas J. Mansor; James R. Sager, both of Sylvania, Ohio, and John W. Juvinall, Ottawa Lake, Mich., assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 11, 1981, Ser. No. 242,808

Int. Cl.³ B07C *5/34*; G06F *15/46*

U.S. Cl. 209—523 **18 Claims**



3. In a glassware production line including a forming machine wherein bottles are formed in molds which apply an identifying code unique to each mold to every formed bottle and means for inspecting the bottles for defects, a finished product controller for monitoring the performance of the glassware forming machine and bottle inspection means, comprising:

a primary inspection loop including first means for inspecting a portion of the bottles for defects and first means for reading the mold identifying code on those bottles;

means responsive to said first means for inspecting and said first means for reading for correlating the detected defects in said primary inspection line bottles to the mold producing them;

a secondary inspection loop including second means for inspecting others of the bottles for defects;

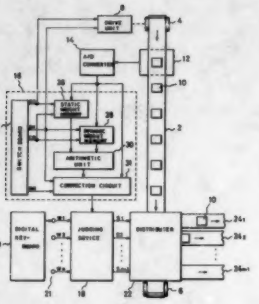
a second means for reading the mold identifying codes on all the bottles received from said primary and secondary inspection loops; and

means responsive to said means for correlating, said second means for inspecting and said second means for reading for determining if bottles formed in defective molds are being identified by said second means for reading.

4,413,739
AUTOMATIC WEIGHT SORTER

Toru Kohashi, Hyogo, Japan, assignor to Yamato Scale Company, Limited, Hyogo, Japan

Filed Feb. 22, 1982, Ser. No. 350,606
Int. Cl.³ B07C 5/28; G01G 11/06
U.S. Cl. 209—593 1 Claim



1. An automatic weight sorter, comprising a weighing conveyer for transporting successively articles to be weighed, a weighing device located in the midway of said conveyer for weighing successively said articles one by one to produce weight signals indicative of the weights of said articles, a correction device coupled to said weighing device for receiving said weight signals and applying a predetermined correction thereto, a judging device coupled to said correction device for receiving the corrected weight signal output of said correction device and judging which one of a plurality of predetermined ranges of weight is to be assigned to each of said corrected weight signal outputs to produce a sorting signal indicative of the assigned range of weight, and a distributing device coupled to said conveyer and judging device for sending said article which has been weighed along a predetermined path in accordance with said sorting signal, said correction device including a first change-over switch for producing alternatively a first command signal specifying static measurement and a second command signal specifying dynamic measurement, a second change-over switch for producing alternatively a third command signal specifying normal operation and a fourth command signal specifying correcting operation, a first memory responsive to said first and fourth command signals for storing said weight signal input at that time, a second memory responsive to said second and fourth command signals for storing said weight signal input at that time, an arithmetic unit coupled to said first and second memories for receiving their outputs and calculating a value of a predetermined function having said outputs as its variables, and a correction circuit responsive to said second and third command signals for receiving the outputs of said arithmetic unit and said weighing device and applying a predetermined correction based upon said value of function to said weight signals, and said weighing conveyer is provided with driving means for stopping said conveyer in response to said first command signal and starting said conveyer in response to said second command signal.

4,413,740
ELECTRONIC PACKAGING TECHNIQUE

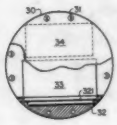
Kenneth P. Lusk, Ridgecrest, Calif., assignor to The United of America as represented by the Secreatary of the Navy, Washington, D.C.

Filed Aug. 24, 1981, Ser. No. 295,353
Int. Cl.³ H05K 7/18, 7/20
U.S. Cl. 211—26 9 Claims

1. An electronic chassis for mounting circuitry within a cylindrical volume comprising:

a plurality of circular bulkheads having radii corresponding to the inner radius of said cylindrical volume;

a plurality of support plates placed between adjacent ones of said circular bulkheads to define a plurality of longitudinally aligned circuit confining volumes separated by said circular supports, each support plate having a planar side for the support of electronic components, and a convex arcuate side for alignment with the circumference of said circular bulkhead;



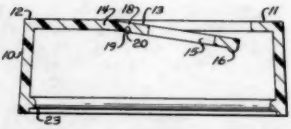
a pair of elongated cylindrical fasteners extending from each end of each support plate and passing through said circular bulkheads, the longitudinal axes of corresponding ones of each pair being aligned to permit hinging movement thereabout upon removal of the other fastener of each pair; and

the support plates of each circuit confining volume being circumferentially displaced with respect to those of adjacent volumes.

4,413,741
HANGER ASSEMBLY FOR BOTTLES

Leon T. Curchack, Los Angeles, Calif., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Dec. 16, 1981, Ser. No. 331,332
Int. Cl.³ B65D 25/22
U.S. Cl. 215—100 R 25 Claims



1. A method for hanging an article, said article connected to a hanger assembly having a skirt with an upper rim and a tab substantially rigidly appending inwardly from said skirt in a plane substantially parallel to that which is defined by the rim of said skirt, said tab including (a) a suspension means for suspending the article, (b) a frangibly-activated hinge spaced between the skirt and the suspension means, and (c) means interposed between the hinge and skirt for resilient displacement of the suspension means along an axis generally parallel to that of the skirt whereby shock and stress on the hinge is adsorbed, the method comprising applying sufficient force to the suspension means in a direction generally perpendicular to the plane defined by the rim of the skirt to break a portion of the hinge and thereby allow rotation of the suspension means about the hinge.

4,413,742
CHILD-RESISTANT CLOSURE MEMBER

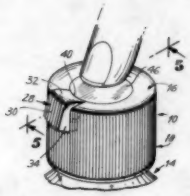
Jeffrey Sandhaus, Rte. 9W, Snedens Landing, Palisades, N.Y. 10964

Filed Dec. 28, 1981, Ser. No. 335,216
Int. Cl.³ B65D 55/02
U.S. Cl. 215—216 13 Claims

1. In a unitary closure member formed of a deformable

material and having a top and an integral peripheral skirt, said closure member being adapted to be threadedly fastened onto the neck of a container so that said top closes the open end of the container, the improvement comprising:

said closure member skirt has screw threads formed on the inwardly facing surface thereof adapted to threadedly cooperate with screw threads formed on the outer surfaces of the neck of a container to allow said closure member to be rotatably screwed onto the container neck, and a locking member integrally formed with said closure member and having a locking portion, said locking member being movable between a first position wherein said locking portion extends into an interior space defined by said skirt inwardly of said inwardly facing surface thereof and a second position wherein said locking portion is withdrawn from said interior space, said locking member



being constituted at least in part by a segment of said peripheral skirt, and wherein said locking portion constitutes a protruding portion extending inwardly from said skirt segment, said peripheral skirt segment being at least partially separated from said skirt so as to be movable relative to said skirt between said first position wherein said protruding portion extends into said interior space and said second position wherein said protruding portion is withdrawn from said interior space, and wherein said locking member is further constituted by a segment of said closure top, said closure top segment being integral with and forming a continuation of said peripheral skirt segment and being at least partially separated from said top so as to be movable with respect thereto; and

means formed integrally with said closure member for moving said locking member between said first and second positions.

4,413,743

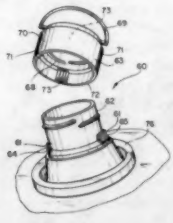
CHILD-RESISTANT SAFETY CLOSURE

Kenneth L. Summers, Angola, Ind., assignor to Rieke Corporation, Auburn, Ind.

Continuation of Ser. No. 314,652, Oct. 26, 1981, abandoned, which is a continuation-in-part of Ser. No. 217,409, Dec. 17, 1980, Pat. No. 4,351,442. This application Nov. 10, 1982, Ser. No. 440,516

Int. Cl.³ B65D 55/02

U.S. Cl. 215—216 **5 Claims**



1. A child-resistant safety container of the type having a spout and closure cap, said closure cap and spout being cooperatively arranged into a positive-on style and necessitating a two-step release procedure for removal of said cap from said spout, said safety container comprising:

a container body having an externally threaded pour spout;

detent means disposed about said pour spout and including two series of ratchet teeth, the leading edge of the first ratchet tooth of one series being radially spaced from the first ratchet tooth of the other series; and

a flexible, internally threaded closure cap cooperatively arranged for threaded engagement of said spout and having a side wall and two inwardly directed lug means disposed on the interior surface of said cap substantially 180 degrees apart and suitably arranged to provide a positive-on lock with said two series of ratchet teeth, said two lug means each having an axial height of sufficient magnitude to necessitate more than one turn of 180 degrees of said cap relative to said spout in order to disengage the positive-on lock of said lug means with said ratchet teeth.

4,413,744

EXPANDED PLASTIC BOTTLE STOPPER

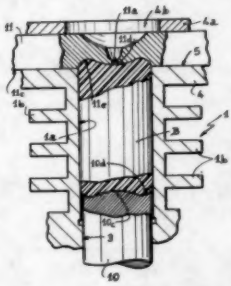
Pierre Babiol, Villefranche sur Saone, France, assignor to Societe Nouvelle de Bouchons Plastiques S.N.B.P., Anse, France

Filed Oct. 26, 1981, Ser. No. 315,074

Claims priority, application France, Dec. 23, 1980, 80 27828

Int. Cl.³ B65D 39/00

U.S. Cl. 215—355 **1 Claim**



1. An improved stopper for insertion into the neck opening of a bottle, the stopper having a solid body made of expanded plastic material, and the body having transverse end walls and having a cylindrical side wall of diameter greater than the diameter of the neck opening prior to radial compression of the body by insertion thereof into the neck opening, the improvements including:

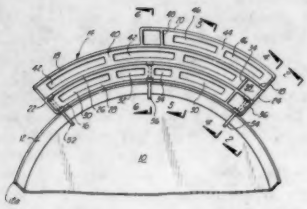
(a) means to facilitate evacuation of surplus air from a bottle when the stopper is driven into its neck opening comprising at least one of the transverse end walls having an end surface surrounded by a bead portion comprising a rounded peripheral edge curving smoothly from the end surface of the transverse wall into the side wall; and

(b) means to avoid convex swelling of a transverse end wall when the stopper is inserted in a neck opening comprising at least one of the transverse end walls having prior to radial compression of the body a concave central depressed portion which is operative in response to radial compression of the body when inserted into the neck opening of a bottle to fill with displaced plastic material and swell toward the end surface of the transverse wall.

4,413,745
TRAY CADDY FOR WAITRESSES

Ray D. Stroud, Oklahoma City, Okla., assignor to Continental Plastics, Oklahoma City, Okla.

Filed May 6, 1981, Ser. No. 261,148
Int. Cl.[3] A47G *23/06*; B65D *21/02, 1/36*
U.S. Cl. 220—23.4 16 Claims



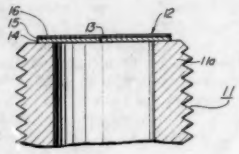
1. A waitress' tray caddy adapted for attachment to a serving tray comprising:
- an inner wall having an upper edge and a lower edge and adapated to register with the outer peripheral portion of a serving tray;
- an outer wall having an upper edge and a lower edge and spaced from the inner wall;
- an intermediate wall between said inner and outer walls and having an upper edge and a lower edge;
- bottom wall means extending between and interconnecting the lower edges of the inner wall and the outer wall, said bottom wall means comprising:
  - a first horizontally extending bottom wall extending from the lower edge of said inner wall to the lower edge of said intermediate wall; and
  - a second horizontally extending bottom wall extending from a location spaced upwardly from the lower edge of the intermediate wall to the lower edge of said outer wall;
- end walls extending between the inner wall and the outer wall;
- partition means between the inner wall and the outer wall and above the bottom wall means and dividing the space between the inner and outer walls into a plurality of vertically tiered chambers for receiving, and making horizontally accessible, a plurality of articles to be served from the tray caddy;
- retainer clip means snap-attachable to the inner wall and to the first horizontally extending bottom wall and including a portion extending beneath said first horizontally extending bottom wall for supporting the caddy upon a surface upon which a serving tray carrying the caddy is rested; and
- nose means projecting from the inner wall and cooperating with said retainer clip means for retainer the caddy attached in a cantilevered fashion to the outer peripheral portion of a serving tray.

4,413,746
PRESSURIZED-FLUID CARTRIDGE AND SAFETY CLOSURE THEREFOR

Yoshihide Matsutani, Fujisawa, Japan, assignor to Miyata Industry Co., Ltd., Chigasaki, Japan

Filed Feb. 10, 1982, Ser. No. 347,725
Claims priority, application Japan, Apr. 10, 1981, 56-52022[U]
Int. Cl.[3] B65D *90/34*
U.S. Cl. 220—89 A 15 Claims

1. A safety closure used to close the mouth of a metallic container of cartridge type for storing a fluid under pressure, said closure being formed by a laminated structure comprising a first layer of a first metal adapted to be welded to said container around said mouth, a second solid layer coextensive with said first layer of a second metal having a corrosion-resistant property, said first layer having a thickness greater than that of said second layer and provided with at least one pressure relief through-hole formed therein, and means disposed between said first and second layers and coextensive with said first layer for

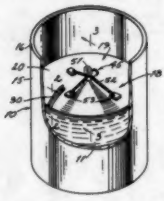


sealingly securing said layers together so that said pressure relief trhough-hole is closed by said second layer and said sealingly securing means, the portion of said second layer facing said pressure relief through-hole being rupturable when the pressure in said container is raised to an unduly high level.

4,413,747
FLOATING LID FOR A LIQUID STORAGE TANK

Tyrus N. Tenold; Michael D. Cossette; James P. Kuntz, and Jack D. Gordon, all of Spokane, Wash., assignors to Spokane Industries, Inc., Spokane, Wash.

Filed Jun. 14, 1982, Ser. No. 387,796
Int. Cl.[3] B65D *88/48, 88/34*
U.S. Cl. 220—225 2 Claims

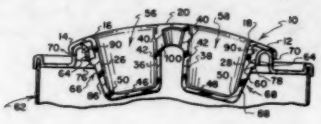


1. A flotation lid for a cylindrical liquid storage tank having upright side walls, comprising:
- a circular top plate having an integral peripheral wall extending axially to a downwardly facing edge surface;
- a circular bottom plate having an integral peripheral wall extending axially toward the top plate to an upwardly facing edge surface;
- an annular rim affixed to the edge surfaces of the circular top and bottom plates forming a sealed cavity defined with the top plate, the rim, and the bottom plate, of sufficient buoyance to float the lid on the liquid surface;
- a circular serrated edge on the annular rim adapted to selectively engage the upright side walls of the tank to seal the tank interior below the bottom plate to minimize exposure of the liquid surface; and
- vent means extending between the top and bottom plates for selectively venting gases from below the bottom plate;
- the top plate including an upwardly facing surface and the bottom plate including a downwardly facing surface and wherein the serrated edge is situated axially between the upward and downwardly facing surfaces; the bottom plate being arched upwardly and being held in its upwardly arched configuration by a tension member from the top plate.

4,413,748
PINCH CAP

Milton Kessler, Youngstown, and Myron E. Ullman, Canfield, both of Ohio, assignors to Kessler Products Co., Inc., Youngstown, Ohio

Filed Jul. 22, 1982, Ser. No. 400,633
Int. Cl.[3] B65D 43/04
U.S. Cl. 220—281 30 Claims



1. A pinch cap for insertion into a container opening to releasably close the opening, comprising:

(a) a top wall with edge portions which form a rim having a size which is greater than that of a container opening that is to be closed by the cap, the rim being configured to overlie container portions which surround the container opening;

(b) side wall portions which depend from the top wall at locations inset from the rim, the side wall portions having shapes which conform substantially to the shape of at least parts of the container opening, and being configured to permit the side wall portions to be inserted into the container opening;

(c) locking means carried on the side wall portions and projecting outwardly therefrom for engaging the container as the cap is inserted into the container opening, and for deforming the normal configuration of the cap sufficiently to permit at least selected portions of the locking means to be inserted through the container opening as the cap is inserted, the selected portions being configured to underlie and engage such container portions as define the container opening for retaining the cap in a position closing the container opening;

(d) the cap being formed as a one-piece, resiliently deformable structure molded from resilient plastics material which has a memory that tends to return the cap to its normal molded configuration if the cap has been deformed, and having a pair of spaced portions which are movable relatively toward and away from each other during cap deformation; and,

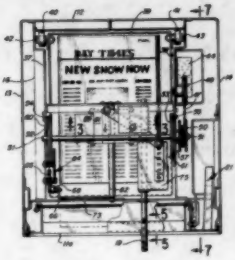
(e) formation means including a pair of finger-receiving wells which open upwardly through the top wall at spaced locations, with each of the wells being connected to a separate one of the spaced, relatively movable portions for providing access thereto to enable the spaced, relatively movable portions to be gripped and pinched together to deform the normal configuration of the cap sufficiently to release the selected portions of the locking means from engagement with the container to permit the cap to be removed from the container opening.

4,413,749
NEWSPAPER DISPENSING APPARATUS AND METHOD

Robert L. Glaser, Chicago, Ill., assignor to Single Vend, Inc., Chicago, Ill.

Filed Jun. 5, 1981, Ser. No. 270,930
Int. Cl.[3] B65H 3/22
U.S. Cl. 221—1 10 Claims

9. A method of dispensing a single generally flat article, such as a newspaper, from within an enclosure having front, rear and lateral walls which comprises; forming a stack of said articles on a supporting elevator platform mounted within said enclosure; arranging said articles in said stack with any folded edge parallel with the lateral walls of said enclosure, positioning said stack directly below an article engaging means adapted to engage the uppermost article in said stack, moving said elevator platform to bring the uppermost article in said stack into engagement with said article engaging means, braking the movement of said elevator platform in response to a predetermined pressure being applied to said article engaging means by said uppermost article in said stack, and moving said article engaging means forwardly while in engagement with said uppermost article to dispense a portion of said uppermost

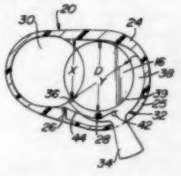


article outwardly from within said enclosure, whereby the pressure between said article engaging means and said uppermost article in said stack is directly controlled to prevent applying an excessive amount of pressure on said article engaging means; thereby avoiding having more than one article dispensed from said enclosure with each forward movement of said article engaging means.

4,413,750
CHIP DISPENSER

John J. Morrone, and Mary J. Morrone, both of 114 Payson Ave., Audubon, N.J. 08106

Filed Jun. 29, 1981, Ser. No. 278,521
Int. Cl.[3] B65G 59/06
U.S. Cl. 221—263 7 Claims



1. A hand held chip dispenser comprising:

a body,

a chamber within the body, the chamber having a lower wall and a side wall formed by a ledge extending upwardly from the lower wall,

a bore passing downwardly through the body, a bore inlet being formed in the lower wall of the chamber, a bore outlet being formed at the bottom of the body,

a cowl connected to the body adjacent to the ledge, a wall of the cowl being generally parallel to the lower wall of the chamber and forming an upper wall of the chamber, the cowl having a generally vertical opening extending therethrough and being offset with respect to the bore inlet,

a chip supply means associated with the cowl whereby a chip adapted to be dispensed passes through the cowl, and

a single crescent-shaped dispensing member having first and second horns pivotably disposed within the chamber,

the dispensing member being biased by a biasing means to a ready position in which the distance between the tip of the first horn of the dispensing member and an opposed side wall of the chamber is less than the diameter of a chip

adapted to be dispensed so as to prevent the chip from being dispensed,

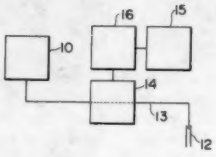
the dispensing member having an actuating means for pivoting the dispensing member to a dispensing position wherein the distance between the tip of the first horn and the opposed side wall is greater than the diameter of the chip and the chip is moved to a position over the bore inlet by the second horn.

4,413,751

METHOD FOR DISPENSING A PRESELECTED AMOUNT OF LIQUID

Sadao Tokorozawa, Kanagawa, Japan, assignor to Pilot Man-Nen-Hitsu Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 19, 1978, Ser. No. 926,057
Claims priority, application Japan, Jul. 19, 1977, 52-86191
Int. Cl.³ F04B *43/12*
U.S. Cl. 222—1 **10 Claims**



1. A method of dispensing a preselected amount of a liquid drop-by-drop from a reservoir, said liquid being pumped intermittently to a discharge pipe by the successive peristaltically squeezing and releasing of an elastic tube carrying said liquid and connected to said discharge pipe, said discharge pipe having a discharge port with a face, said face being perpendicular to the longitudinal axis of said discharge pipe, the outer diameter of said discharge pipe at said discharge port being less than or equal to twice the inner diameter of said discharge pipe at said discharge port, said preselected amount of said liquid dispensed in a drop-by-drop fashion from said discharge port satisfying the following conditions:

(1) $V=Q\times M\times C$
(2) 50 mg$\geqq Q$
(3) 0.5 seconds$\leqq M$
(4) 3/seconds$\geqq C$
(5) $1.5\leqq M\times C$

wherein:

V is the weight of the produced liquid drop,
Q is the amount of liquid pumped per each pump,
M is the time interval between successive drops, and
C is the cycle of the pump.

4,413,752

APPARATUS FOR DISPENSING A CARBONATED BEVERAGE

John R. McMillin, Maplewood, Minn., and Peter Strandwitz, Neenah, Wis., assignors to The Cornelius Company, Anoka, Minn.

Division of Ser. No. 1,027, Jan. 4, 1979, Pat. No. 4,305,527, which is a division of Ser. No. 806,136, Jun. 13, 1977, Pat. No. 4,143,793. This application Oct. 20, 1980, Ser. No. 227,857
Int. Cl.³ B67D *5/54*
U.S. Cl. 222—56 **4 Claims**

1. Apparatus for dispensing a carbonated beverage, comprising:

(a) a plurality of beverage dispensing valves:

(b) a beverage reservoir fluidly connected to each dispensing valve;

(c) a beverage supply conduit having

(1) a donwstream end fluidly connected to said reservoir,

(2) an upstream end having thereon means for fluidly connecting the beverage conduit to a supply vessel having carbonated beverage therein, and

(3) a normally closed beverage supply valve between the upstream and downstream ends for normally precluding flow of carbonated beverages through the conduit;

(d) a supply vessel propellant gas conduit having

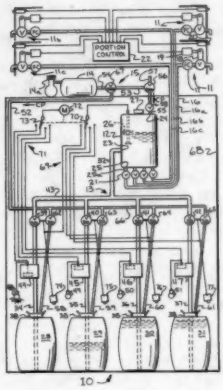
(1) an upstream end adapted to be fluidly connected to a supply of pressurized propellant gas,

(2) a downstream end having thereon means for fluidly connecting said gas conduit to said supply vessel, and

(3) means for regulating propellant gas pressure at the downstream end of said gas conduit at a predetermined level of pressure;

(e) a reservoir propellant gas conduit having

(1) an upstream end adapted to be fluidly connected to a source of pressurized propellant gas,



(2) a downstream end fluidly connected to said reservoir, and

(3) means for regulating the pressure of propellant gas within the reservoir at a level of pressure at least equal to the carbonation saturation pressure of beverage within the supply vessel and less than the predetermined level of pressure at the downstream end of said supply vessel gas conduit;

(f) means for sensing the quantity of carbonated beverage within the reservoir; and

(g) means operatively connected said sensing means to said beverage supply valve for opening said beverage supply valve upon the sensing of less than a predetermined quantity of carbonated beverage within the reservoir by said sensing means.

4,413,753

DISPENSER FOR CYANOACRYLATE ADHESIVES

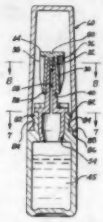
Hugh J. Stock, Saratoga, Calif., assignor to Pacer Technology and Resources, Inc., Campbell, Calif.

Continuation of Ser. No. 150,151, May 15, 1980, abandoned. This application Feb. 5, 1982, Ser. No. 346,117
The portion of the term of this patent subsequent to Oct. 11, 2000, has been disclaimed.
Int. Cl.³ B01L *3/00*; B65D *1/08, 17/24*
U.S. Cl. 222—149 **4 Claims**

1. A dispensing tip internally attachable to the mouth of a necked container of liquid adhesive for dispensing the adhesive, said dispensing tip comprising in combination:

(a) an hollow boss for sealingly engaging the interior cylindrical surface of the neck of the container, said boss including a disc section extending across the mouth of the container for supportingly contacting the extremity of the neck;

(b) a conical tip extending from said boss for dispensing the adhesive;
(c) a diametrically oriented ridge extending from said disc section on opposed sides of said conical tip for providing an engageable element by apparatus used to install and hermetically seal said dispensing tip with the container;
(d) a passageway extending from said hollow boss through said conical tip for discharging the adhesive to be dispensed;
(e) a stopper detachably attached to the end of said conical tip for hermetically sealing said passageway prior to detachment of said stopper from said tip, said stopper including a disc extending radially at the extremity of said conical tip, an inverted conical shroud extending from the axial center of said disc, said conical shroud including a



cavity having an interior conical surface for receiving said conical tip and a plug enclosed within said cavity for engaging said passageway on mounting of said stopper upon said conical tip to force flow of any residual adhesive within said passageway into the container, and a pair of flanges disposed upon opposed sides of said shroud and joined with said disc for providing an enlarged surface area to grip said stopper and which grip in constrained against sliding by said disc;
(f) a break away junction between said tip and said stopper for detaching said stopper from said tip, said junction including an annular indentation about said tip and circumscribing said passageway; and
(g) a length of said passageway extending beyond said junction and into said disc for assuring formation of a discharge outlet on detachment of said stopper from said tip.

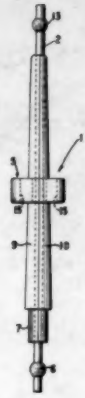
4,413,754

DISPENSER OF SMALL QUANTITIES OF LIQUIDS

Frank Landwehr, Hochdorf, and Heinz Wanner, Biberach, both of Fed. Rep. of Germany, assignors to Dr. Karl Thomae GmbH, Biberach an der Riss, Fed. Rep. of Germany

Filed Mar. 3, 1982, Ser. No. 354,206
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1981, 8107209[U]
Int. Cl.³ B65D *37/00*
U.S. Cl. 222—209 **5 Claims**

1. An apparatus for dispensing small quantities of fluid which comprises a hinged clamping member with a bellows means attachment for receiving a primary packing means in the form of an elongated cylindrical tube containing fluid and having sealed ends, said bellows means attachment having a cylindrical shaft, wherein the hinged clamping member consists of two half-shells which enclose an inner space; the two half-shells are enclosed by a retaining and supporting member; the retaining and supporting member consists of symmetrical halves which are connected to each other by a hinge; the inner diameter of the inner space corresponds to the outer diameter of the tube; the two halves of the retaining and supporting member have, adjacent to the hinge, recesses with stops and, on the side opposite the hinge, a locking or snap-fit means; the hinged half-shells comprise, at one end, a shaft whose outer diameter corresponds to the inner diameter of said cylindrical shaft of said bellows means attachment; the bellows means attachment is provided with an opening which permits the bellows means attachment to be pushed onto the shaft; and the retaining and supporting device comprises, on its outer periph-



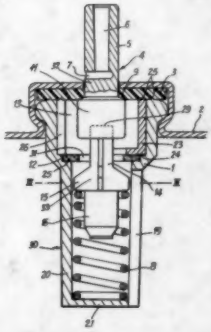
ery, recesses which are adapted to fit the thumb and middle finger.

4,413,755

METERED AEROSOL VALVE FOR USE IN INVERTED POSITION

Michel Brunet, Sainte Colombe La Commanderie, France, assignor to Etablissements Valois, Le Neubourg, France

Filed Mar. 30, 1982, Ser. No. 363,748
Claims priority, application France, Mar. 30, 1981, 81 06272
Int. Cl.³ B65D *83/00*
U.S. Cl. 222—402.2 **5 Claims**



1. A valve for being mounted in the opening of a pressurized container, for being filled up with a liquid material to be atomized, containing a propellant miscible gas solved under pressure in said liquid material, and for expelling precise metered amounts of material when the container is maintained in inverted position with the opening downwards, comprising a valve body (1) of tubulr form, said body forming at its upper part, when the container is in upright resting non inverted position, a metering chamber (13) adjacent to the container opening, limited by a generally cylindrical wall (23,26), two radial walls formed by a first upper annular gasket (3) with a central opening and a second lower annular gasket (12) with a central opening (31), and a valve stem (4) extending through gasket openings and including an upper extension (5) extending out of the valve, said stem comprising between gasket (3) and

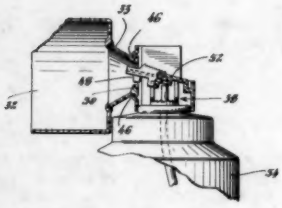
gasket (12) a bulge (11) provided for closing opening (31) by downward movements, said stem (4) extending downwards by comprising a slender part (14) passing through opening (31) when the valve is at rest, and a guiding shank (16), the upper outer part (5) of stem (4) comprising an axial canal (6) externally communicating through a passage (7) located outside of the valve when said valve is at rest and inside of the valve when the stem is displaced downwardly, said valve body forming at its lower part a tubular housing (30) with a bottom (21) for receiving a return spring finding its upper abutment against a shoulder (15) of the stem and its lower abutment against bottom (21), wherein the slender part (14) of stem (4) is formed with ribs (17), and housing (30) is formed with a longitudinal opening (19), the number of openings (19) being different from the number of ribs (17).

4,413,756

AEROSOL INSECT EXTERMINATOR DEVICE

Joseph F. Kirley, 138 Crescent Rd., Concord, Mass. 01742

Filed Dec. 20, 1978, Ser. No. 971,394
Int. Cl.³ B65D *83/14*; B05B *9/03*
U.S. Cl. 222—402.11 **4 Claims**



1. In an insect exterminating device, an aerosol can having a liquid propellent, a rotatable valve assembly having a valve lever connected to a valve supply tube, the latter having its free end submerged in said liquid propellent, the invention comprising: a discharge orifice for said liquid propellent having an enlarged part at the forward end thereof provided with a flat edge that can be placed against a flat surface such as a wall to form an enclosure trapping an insect therein, means for venting said enlarged part, a mounting fixture inserted on the top of said can having said valve lever movably secured thereto, a connecting member connecting said enclosure to said mounting fixture, said connecting member having a flexible part, said valve lever and connecting member respectively provided with aligned abutments in the inactive condition of said device so that the valve lever cannot be depressed to discharge a quantity of liquid propellent, and when said enclosure is pressed firmly against a flat surface said flexible part is caused to flex whereby said enclosure is forced inwardly, and said abutments are caused to be moved out of alignment thereby permitting the valve lever to be depressed to release a quantity of liquid propellent through said orifice which upon sudden expansion forms a cold gas that freezes said insect within said enclosure.

4,413,757

DISPENSER FOR REPELLING ANIMALS

Harold A. Adler, 1457 Eastwind Cir., Westlake Village, Calif. 91361

Filed Mar. 9, 1981, Ser. No. 242,039
Int. Cl.³ B65D *1/32*
U.S. Cl. 222—105 **1 Claim**

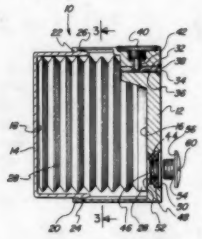
1. A hand held dispenser for a pungent liquid to repel animals comprising:

a first housing section having a first internal chamber;

a second housing section having a second internal chamber and an end wall, said first and said second housing sections being telescopingly connected together so said first and second internal chambers cooperate together to form a single enlarged chamber, said second housing section being telescopingly movable with respect to said first housing section by squeezing said end wall toward said first housing section so as to forcefully rapidly and sharply reduce the volume of said single enlarged chamber;

an outlet valve assembly attached to said first housing section, said outlet valve assembly to be capable of dispensing a directed stream of liquid;

a bladder adapted to contain an animal-repelling pungent liquid, said bladder being located within and substantially filling said single enlarged chamber, said bladder having a liquid inlet and a liquid outlet, said liquid outlet connecting with said outlet valve assembly, whereby upon moving of said second housing section relative to said first housing section decreasing the volume of said single enlarged chamber the said bladder is compressed causing discharge of liquid from said bladder through said outlet valve assembly, said bladder having a bottom end directly bearing against said end wall and being completely corrugated on its sides so that, when collapsed by said squeezing action, said bladder is substantially emptied of said liquid by a continual progressive squeezing operation in the liquid discharging direction;



said first housing section having a front end wall, said front end wall having an outlet opening extending completely therethrough so as to communicate with said first internal chamber, said bladder being integrally provided with an outlet tube located in and completely filling said outlet opening and having an outer end captured by said front end wall, said outlet valve assembly comprising a manually operable knob rotatably mounted on said first housing section and having an end portion protruding laterally into said outlet opening and bearing against said outlet tube for manually selectively closing said tube by lateral restriction thereof and adjustably opening said tube for selective discharge of said fluid;

said front end wall having an inlet opening extending completely therethrough so as to communicate with said first internal chamber, said bladder being integrally provided with a flexible walled inlet conduit located in and completely filling said inlet opening and having an outer end captured by said front end wall, a plug removably insertable into said conduit and oversize with respect to said conduit so as to tightly press said flexibly walled conduit against said first housing section to seal said bladder against fluid leakage.

4,413,758

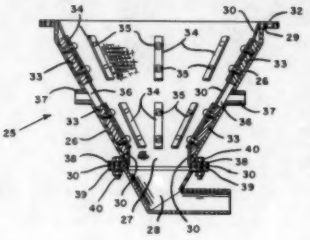
COMPLETE AIR-FLOW DISPENSERS

Armon J. Walters, 39 Haverhill Rd., Trumbull, Conn. 06611

Filed May 22, 1981, Ser. No. 266,235
Int. Cl.³ B65G *69/06*
U.S. Cl. 222—195 **8 Claims**

1. An air-flow container assembly adapted to receive a supply of solid, particulate material and to dispense said material through an opening in the base thereof under the influence of

pressurized fluidizing air introduced to said container, said assembly comprising an upper air-flow product compartment and a lower air-flow base which is releasably attached to said product compartment, said base comprising a porous floor for said product compartment comprising an air space covered by a layer of air-permeable fabric, and means for receiving a supply of pressurized fluidizing air into said air space and for directing said air up through said air-permeable floor to fluidize product in contact with said floor, said product compartment having a rigid outer wall, a porous inner wall comprising a layer of air-permeable fabric supported by said outer wall closely spaced therefrom to provide a narrow interconnected air space therebetween which substantially completely surrounds said product compartment, and means for receiving a supply of pressurized fluidizing air through said rigid outer wall and into said narrow interconnected air space to cause said fluidizing air to surround said product compartment and pass through said air-permeable inner wall from all sides to fluidize product in contact with said inner wall and cause said fluidized product to flow down to said air-flow base, said base and said product compartment each comprising means for releasably attaching said elements to each other and for confining therebetween adjacent extremities of the layers of the fabrics which form the porous floor of said base and the porous wall of said product compartment to isolate the air spaces underlying said porous floor and said porous wall.



4,413,759

DISPENSER FOR PASTY COMPOSITIONS

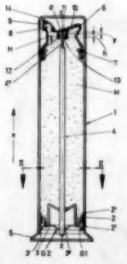
Herbert Mettenbrink, Lohne, Fed. Rep. of Germany, assignor to Bramlage GmbH, Lohne/Oldenburg, Fed. Rep. of Germany

Filed Nov. 6, 1981, Ser. No. 318,701

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1980, 3045048

Int. Cl.³ B05B *11/04*; A47K *5/12*

U.S. Cl. 222—213 **9 Claims**



1. In a dispenser for pasty composition, having a nozzle opening, a catch, a dispenser housing, and a piston which is arranged for displacement in the dispenser housing, travels in a direction towards said nozzle opening upon emptying of the dispenser, and is blocked in the opposite direction by said catch, a headpiece of said dispenser housing, and a push-button actuating surface which is provided on said headpiece, the headpiece being collapsible in bellows-like manner, pressing said headpiece increasing pressure on said pasty composition thereby forcing it through said nozzle, the improvement comprising

a rod passes through the piston and is operatively coupled with the headpiece via a free path,

means comprising another catch for coupling said rod in force-locked manner to the piston, said means operates in a direction opposite the first-mentioned catch.

4,413,760

DISPENSING DEVICE HAVING RATCHET MEMBER

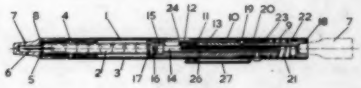
John S. Paton, Beith, Scotland, assignor to Greater Glasgow Health Board, Glasgow, Scotland

Filed Mar. 31, 1981, Ser. No. 249,448

Claims priority, application United Kingdom, Apr. 8, 1980, 8011572

Int. Cl.³ B67D *5/42*

U.S. Cl. 222—309 **8 Claims**



1. A dispensing device suitable for use in dispensing a predetermined quantity of material from a container comprising a tubular body member having one end, said one end having an outlet, and a plunger slidably movable in said body member towards said outlet, said dispensing device comprising:

an elongate body having a first end portion and defining a chamber for receiving a said container with said outlet of said container held in said first end portion of the elongate body;

a first drive member slidably mounted on said body;

an unidirectional drive transmission means disposed for driving engagement with said first drive member, at least in use of the device;

a second drive member having a free end, said free end being drivingly engageable with said plunger of the container, in use of the device, so that said second drive member and said plunger can be driven by the first drive member via said unidirectional drive transmission means, in use of the device for dispensing, only in a direction towards the container outlet and the first end portion of the elongated body whilst permitting return movement of the first drive member;

said unidirectional drive transmission means comprising a plurality of ratchet teeth on one of said first and second drive members and a pawl means on the other disposed for unidirectional driving engagement with said ratchet teeth;

said device including a resilient biasing means disposed in said elongate body for biasing said first drive member in a direction for providing return movement of said first drive member;

wherein one of said elongate body and first drive member is provided with a stop means and the other with axially spaced apart first and second abutment means, said abutment means being disposed on either side of said stop means for co-operation therewith so as to define a maximal displacement of the first drive member thereby to determine a maximal dispensing dose for a single stroke of the first drive member.

4,413,761

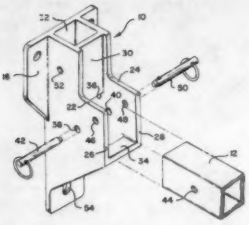
SUPPORT APPARATUS FOR MOTOR VEHICLE BUMPER RACK MEMBERS

Norman Angel, 2321 Carolton Rd., Maitland, Fla. 32751

Continuation-in-part of Ser. No. 298,340, Aug. 31, 1981, abandoned. This application Jun. 9, 1982, Ser. No. 386,601

Int. Cl.³ B65R *9/06;* **A47F** *5/00;* **B60R** *19/02*

U.S. Cl. 224—42.45 R **9 Claims**



1. A support apparatus for motor vehicle bumper rack members comprising:

(a) a vertical back plate member for joining to the bumper;

(b) a pair of parallel spaced apart side members perpendicularly joined to the back plate, each having a front edge;

(c) a partition member means perpendicularly joining the side members, spaced in parallel from the back plate and having a bottom edge and forming a socket area with the back plate and the side members to receive and position a bumper rack member in a vertical position; and

(d) a strut member joining the side members near the front edge of the side members, the strut member is positioned below the bottom edge of the partition member means a distance to permit a bumper rack member to be inserted between the bottom edge of the partition member means and the strut member, each side member having aligned first holes between the bottom edge of the partition member means and the strut member to receive a pin which passes through a rack member to prevent horizontal movement of the rack member and to serve as a pivot point for movement of the rack member from a horizontal position to a vertical position and each side member having aligned second holes slightly above the bottom edge of the partition member means to receive a pin across a top surface of a horizontal rack member to prevent vertical movement of the rack member when it is in a horizontal position and to maintain the rack member when it is placed in a vertical position.

4,413,762

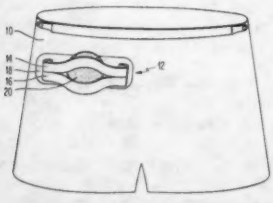
GAME BALL HOLDER

Edward Carini, 20 Stewart Pl., Mount Kisco, N.Y. 10549

Filed Oct. 22, 1981, Ser. No. 313,803

Int. Cl.³ A45F *5/00*

U.S. Cl. 224—250 **10 Claims**



1. A ball holder adapted for use on a garment comprising two elongate strips of elastic material, each having two ends and two lateral edges, said strips being arranged side by side with one lateral edge of one strip adjacent to one lateral edge of the other, the adjacent lateral edges being joined together along a prescribed length from each end and unjoined for a prescribed length midway between said ends, the ends of said strips being adapted for attachment to a garment.

4,413,763

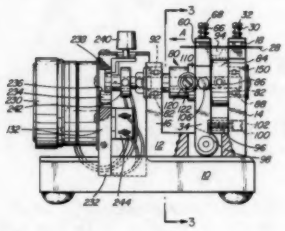
METHOD AND APPARATUS FOR BREAKING AN OPTICAL FIBER

Helmut H. Lukas, Carleton Place, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jul. 13, 1981, Ser. No. 282,819

Int. Cl.³ C03B *37/16*

U.S. Cl. 225—2 **27 Claims**



1. A method of breaking an optical fiber, including the steps of scoring the fiber transversely to its length to produce a score, and tensioning the fiber longitudinally to cause a crack to propagate from the score completely across the fiber, wherein a level of tension sufficient to cause the crack to propagate across the fiber is applied to the fiber after, but not during, the scoring step, and during the scoring step the fiber is subjected to a controlled tension insufficient to sever the fiber when scored, the first-and second-mentioned tension being produced substantially without bending of the fiber by stretching it between spaced locating means and urging said locating means apart.

4,413,764

GUIDE FOR TRACTOR FEED FOR PAPER WEBS IN OFFICE MACHINE

Wendelin Weber, Siegen, and Manfred Rosenthal, Kirchen, both of Fed. Rep. of Germany, assignors to U. S. Philips Corporation, New York, N.Y.

Filed Sep. 14, 1981, Ser. No. 301,568

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1980, 3036642

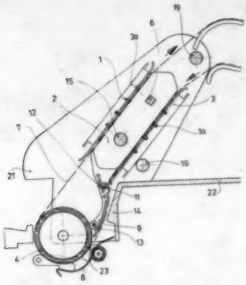
Int. Cl.³ B65H *17/34;* **G03B** *1/30*

U.S. Cl. 226—170 **10 Claims**

1. A tractor feed device for paper webs, comprising two associated shafts, two tractors each journalled on said shafts and arranged to be driven by at least a first one of said shafts; each tractor comprising an endless transport chain having pins and arranged to pass about said shafts so as to define two longitudinal sides, and a pair of deflectable retaining flaps on the longitudinal sides of the tractor; said device further comprising a pivotable guide piece arranged adjacent an end face of a tractor, said device being adapted to feed a paper web along one longitudinal side of the tractors over said guide to a printing backing around which the web is guided, the web then being discharged along the other longitudinal side of the tractors,

characterized in that said guide piece is arranged to extend from the tractor to the vicinity of a zone in which the paper web first contacts the printing backing, in that at least one said guide piece is pivoted to a respective tractor in a hinged manner, and said guide piece has a surface

which contacts a paper web being so fed and which lies at a location within a loop formed by the paper web substantially in a plane tangential to the printing backing at the zone of first contact between the paper web and the printing backing.

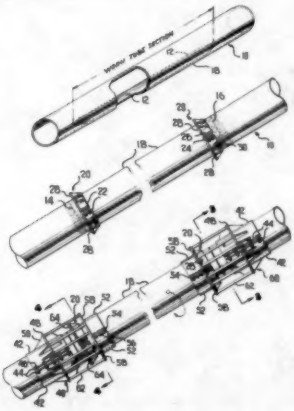


4,413,765

METHOD AND APPARATUS FOR IN SITU REPAIR OF A WORN PIPE SECTION

Fred L. Tracy, P.O. Box 111, 40th Ave. & County 4, Roll, Ariz. 85347

Filed Feb. 23, 1981, Ser. No. 237,526
Int. Cl.[3] B23K 37/04
U.S. Cl. 228—119 20 Claims



1. The method of repairing in situ a pipe section which has been unduly worn along a portion of its inner circumference by friction of material fed therethrough, comprising the steps of:
(1) marking the ends of said worn pipe section,
(2) clamping the worn pipe section coaxially aligned and longitudinally in place with respect to the remainder of the pipe, and while retaining the pipe section clamped as per step (2) performing the further steps of
(3) cutting said pipe at the marked ends to free the worn pipe section from the remainder of the pipe,
(4) rotating the freed pipe section a sufficient degree to displace the worn surface portion from substantial further contact with material to be fed through the pipe, and
(5) reconnecting the rotated pipe section to the remainder of the pipe.

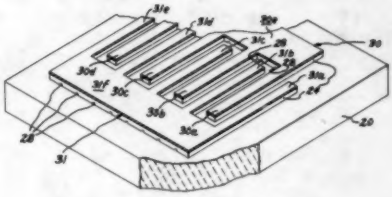
13. Clamp apparatus for in situ repair of a section of pipe unduly worn in its side wall by freeing said worn section, rotating it axially, and re-connecting said worn section to the non-worn section, said apparatus comprising first and second elongated clamp means adapted to be mounted at spaced apart locations on the exterior of said pipe adjacent to the opposite ends of said worn section, each of said clamp means comprising
attachment means for mounting said clamp means on said pipe, and
bearing means spaced from said attachment means for supporting said worn pipe section aligned with said non-worn section and permitting rotation of said worn section with respect to said non-worn section after it is freed from the non-worn section of said pipe,
wherein said bearing means comprises an element which encircles said worn section and provides a bearing surface to allow said worn section freedom to rotate with respect to said bearing means when said element is closed to its fullest extent around said worn section.

4,413,766

METHOD OF FORMING A CONDUCTOR PATTERN INCLUDING FINE CONDUCTOR RUNS ON A CERAMIC SUBSTRATE

Harold F. Webster, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 3, 1981, Ser. No. 250,992
Int. Cl.[3] H05K 3/06
U.S. Cl. 228—123 17 Claims



1. A method of forming a conductor pattern including fine conductor runs on a ceramic substrate, comprising:
(a) forming a plurality of grooves in a first side of a metallic sheet, said grooves not crossing portions of said metallic sheet which are to be formed into said fine conductor runs;
(b) direct bonding using an eutectic composition said first side of said metallic sheet onto said ceramic substrate; and
(c) selectively removing metal from a second side of said metallic sheet to form said conductor pattern.

4,413,767

METHOD OF ATTACHING A HANDLE TO A COOKING VESSEL

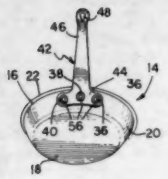
David L. Hellinger, Fort Wayne, Ind., assignor to Lincoln Manufacturing Co., Inc., Fort Wayne, Ind.

Filed May 7, 1981, Ser. No. 261,594
Int. Cl.[3] A47J 35/10, 45/07; B23K 31/02
U.S. Cl. 228—136 7 Claims

1. A method for attaching a handle to a cooking vessel such as a pot or pan including a receptacle at least a portion of which has a curved outer surface, the method comprising:
securing at least two elongated studs to the curved outer surface of the receptacle wherein the studs extend radially outward from the receptacle outer surface and the studs diverge outwardly from the receptacle outer surface,
providing a handle with a mounting portion having two openings therein, the openings being larger than the diameters of the studs and being sufficiently large that the handle can be slipped directly over the diverging studs,
subsequent to securing the studs to the receptacle outer surface, placing the handle openings over the studs so that

the studs enter and extend through respective said handle openings,

inserting a washer into each of the openings and over the respective stud wherein each said washer is disposed



between the stud and the respective opening and the washers substantially prevent movement between the handle and the studs, and

subsequently securing together the handle, washers and the respective studs.

4,413,768

METHOD OF MAKING A MULTI-BORE ELEMENT

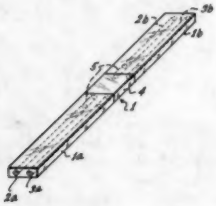
Wolfgang Niwiera; Franz-Josef Holtorf, and Hans H. Biederer, all of Osnabrück, Fed. Rep. of Germany, assignors to Kabel- und Metallwerke, Gutehoffnungshütte AG, Hanover, Fed. Rep. of Germany

Filed Nov. 30, 1981, Ser. No. 325,745

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1981, 3110434

Int. Cl.³ B23K *31/02*

U.S. Cl. 228—173 A **11 Claims**



1. A method of making a copper or copper alloy section having a plurality of blind bores, comprising the steps of

providing two solid blanks;

piercing each blank to obtain therein a plurality of through-bores;

plugging one end of each bore by means of a tight-fitting plug;

resistance-welding the plug ends of the two blanks directly to each other or to a solid blank; and

sizing the bores to the extent that they are not plugged.

4,413,769

CARTON WITH INTERNAL PARTITION

Louis C. Michetti, Santa Clara, Calif., assignor to Container Corporation of America, Chicago, Ill.

Filed Sep. 7, 1982, Ser. No. 415,147

Int. Cl.³ B65D *5/48*

U.S. Cl. 229—27 **11 Claims**

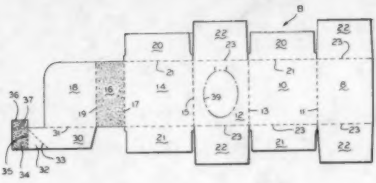
1. A collapsible folding carton with an integral, internal partition, said carton being formed from a unitary blank of foldable paperboard and comprising:

(a) pairs of opposed top and bottom wall panels and side wall panels foldably joined to each other to form a tubular structure open at the ends;

(b) end walls, for closing each end of said tubular structure, each including opposed pairs of closure flaps foldably joined to end edges of said top and bottom wall panels and said side wall panels and adapted to be secured to each other in overlapped relation;

(c) an integral partition panel positioned within said tubular structure intermediate said side wall panels and parallel thereto;

(d) said partition panel:



(i) having a lower edge foldably joined to said bottom wall panel;

(ii) having one end edge, which is generally normal to said lower edge, foldably joined to one of said end walls;

(iii) having its other edges free from attachment to said carton.

4,413,770

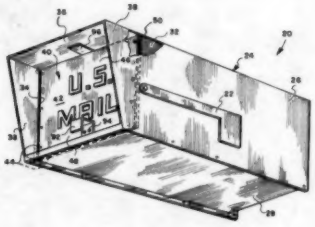
RURAL MAILBOX

Beatrice E. Nye, R.F.D. #1, Fitchville, Conn. 06334

Filed Mar. 4, 1981, Ser. No. 240,562

Int. Cl.³ B65D *91/00*; E06B *7/16*

U.S. Cl. 232—17 **10 Claims**



1. A mailbox comprising:

a body including a plurality of sidewalls having inner surfaces defining an interior compartment for receiving and containing mail and an opening into the interior compartment;

a door for gaining access to the interior compartment of said body including a central member, a peripheral outer edge defining the limits of said central member, and upper and lower ends;

pivot means mounting said door adjacent said upper end within the opening for swinging movement between a closed position lying substantially in a vertical plane and open positions, one whereby said door is swung forwardly about its upper end out of said compartment and another whereby said door is swung rearwardly about its upper end into said compartment;

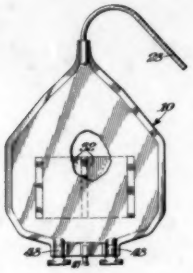
said outer edge of said door being proximate to and enveloped by said inner surfaces when said door assumes the closed position and conforming generally to the opening into the interior compartment; and

sealant means fixed to said door continuously along said outer edge of ssid door for engaging said inner surfaces when said door is in the closed position.

4,413,771
METHOD AND APPARATUS FOR CENTRIFUGAL SEPARATION

Vernon C. Rohde, Newtown, and William A. Romanauskas, Southbury, both of Conn., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 10, 1979, Ser. No. 74,098
Int. Cl.³ B04B *5/02, 11/00*
U.S. Cl. 494—17 **11 Claims**



1. In a sealed, flexible thermoplastic blood centrifugation container having side wall sections with laminate edge seals and a longitudinal axis, two different portions of said edge seals being generally parallel to said longitudinal axis, and a first tubular conduit means sealed between said wall sections, communicating with the interior of said container and intersecting said longitudinal axis, the improvement wherein:

said container includes a septum, defined by a first sheet of a flexible thermoplastic, having ends joined to opposite said side wall sections along laminate seals which are generally parallel to said longitudinal axis, said septum being positioned longitudinally only in the mid portion of said container in the region of said different portions with the top of said septum extending to a point just above the separation line that occurs when blood is separated into plasma on the one hand and packed cells and a buffy coat on the other.

4,413,772
APPARATUS FOR CENTRIFUGAL SEPARATION

Vernon C. Rohde, Newtown, and William A. Romanauskas, Southbury, both of Conn., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

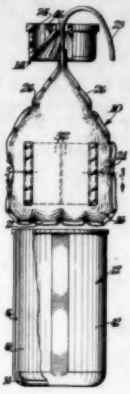
Division of Ser. No. 74,098, Sep. 10, 1979, Pat. No. 4,413,771. This application Sep. 29, 1980, Ser. No. 192,081
Int. Cl.³ B04B *5/02, 11/00*
U.S. Cl. 494—17 **4 Claims**

1. Apparatus for separating particulate material from a fluid phase comprising:

a sealed, flexible plastic fluid storage container having a longitudinal axis and a first tubular conduit means sealed to said container, communicating with the interior of said container and intersecting said longitudinal axis, the portion of said container contiguous the conduit being generally conical,

a hollow cylindrical centrifuging receptacle, adapted for use in a swinging bucket type centrifuge, having a longitudinal axis, being closed at one end, and adapted to receive said container, with the receptacle and container axes coincident,

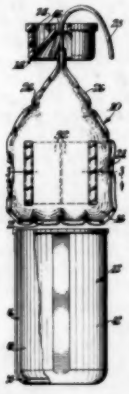
an adapter configured to fit over said conduit means and slide within said receptacle to engage the said container, said adapter being in the shape of an annulus having a V-shaped cross-section and an outside diameter sufficiently less than the inside diameter of the receptacle to allow the container to drape over the V-shaped cross-section, and an inner surface which is conical in shape such that, when the adapter and receptacle are under axial centrifugal force, the adapter maintains the conical portion of said container continguous the conduit under tension and free of wrinkles by virtue of its being draped over the V-shaped cross-section of the adapter.



4,413,773
METHOD AND APPARATUS FOR CENTRIFUGAL SEPARATION

Vernon C. Rohde, Newtown, and William A. Romanauskas, Southbury, both of Conn., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 74,098, Sep. 10, 1979. This application Sep. 29, 1980, Ser. No. 192,082
Int. Cl.³ B04B *5/02, 11/00*
U.S. Cl. 494—37 **6 Claims**



1. A method of separating and maintaining separated particulate material from a fluid phase using a storage container having flexible walls and top, middle and bottom portions with an outlet line at the top portion, by filling said container with said fluid phase,

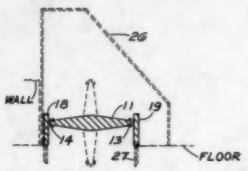
sealing said container,

centrifuging said container in the bucket of a swinging bucket centrifuge top portion up, comprising the steps of:

applying force to the top portion of said container by positioning a collar in the shape of an annulus having a V-shaped

cross section over said top portion and said outlet line, whereby centrifugal force on said collar causes the top portion of said container to drape tautly about said collar's V-shaped cross section and remove wrinkles therefrom.

4,413,774
DIRECT DRIVE AIR REGISTER DAMPER
Willie T. Grant, 400 S. Simms St., Lakewood, Colo. 80228
Filed Mar. 5, 1982, Ser. No. 354,040
Int. Cl.³ F24F *13/10*
U.S. Cl. 236—9 A **9 Claims**



6. Automatic rotatable damper means controlling the temperature within individual environments in a multiple room dwelling having a central heating/cooling system including a heating/cooling device and ducts, said damper means comprising in combination:

(a) closure means,

said closure means comprising a damper housing having longitudinal front and rear panels separated by and connecting to end panels, said end panels being comprised of angular plates normal to said front and rear panels and having fixity with said longitudinal panels, said angular plates supporting a damper blade rotatably mounted within a space internal to said connecting panels; said end panels providing support for said damper housing on means external to said damper housing;

(b) rotatable means having compressible means,

said rotatable means comprising a damper blade having containment means longitudinal to said damper blade and compressible sealing means attaching to longitudinal edges of said damper blade; said damper blade and compressible means in combination pivotally supported in said space of said closure means providing open and closed conditions within said closure means thereby controlling temperature in said environment,

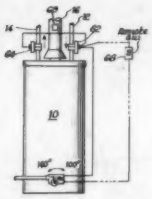
(c) motor means,

said motor means having an electrical motor being energized by circuit control means and providing rotary motion to a shaft attaching to said motor means, said shaft rotatably engaging said damper blade through said containment means formed along a longitudinal axis of said damper blade; said shaft having rotatable engagement with a cam; said cam operating a switch having double throw means, said switch incrementing degrees of rotation of said damper blade;

(d) circuit control means,

circuit control means having components electrically interconnected including a temperature switch having light means and a first and a second switch position, relay means including a relay coil having first and second contacts, and a time delay relay, said relay means statically positioning said motor means and said rotatable means within said closure means in accordance with a preset condition externally established for said heating/cooling device; said circuit control means electrically connecting said temperature switch to said components of said circuit control means jointly operating said motor means and rotating said damper blade and creating an open or closed position in said damper housing controlling the flow of a heating/cooling medium and said environmental temperature thereby.

4,413,775
WATER HEATER CONTROL SYSTEM
Kenneth W. Scott, 601 9th St., Coronado, Calif. 92118
Filed Jul. 12, 1982, Ser. No. 397,628
Int. Cl.³ F23N *1/08*; F24H *1/00*
U.S. Cl. 236—20 R **9 Claims**



1. A control for a thermostat for a water heater or the like having an incoming fresh water line, an outgoing hot water line, a heating means and a thermostatic control for said heating means, said control comprising:

(a) a first temperature sensor switch mounted on said incoming line set to close and remain closed at or below a temperature higher than incoming water temperature but lower than the temperature of standing water in said line;

(b) a second temperature sensor switch mounted on said hot water line which is closed at and below a pre-determined temperature which is in the range of desirable temperatures for hot water;

(c) means for alternately setting said thermostat at a low setting and a high setting and a circuit actuating said means to set said thermostat at said high setting in general when both of said switches are closed, and otherwise said thermostat is set at the low setting;

(d) retarder means for reducing the number of burns of said heating means caused by short sporadic bursts of hot water demand causing the frequent opening and closing of said first switch;

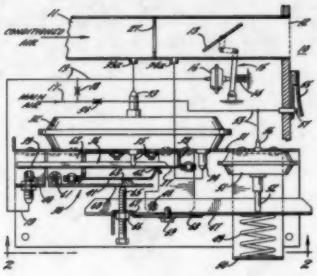
(e) a remote switch for said contact capable of overriding said circuit to establish said thermoswitch selectably at said high and low positions; and

(f) a timer for said remote switch operative to switch said remote switch from the high position to the "auto" position after the lapse of a pre-set time.

4,413,776
RESET CONTROLLER WITH IMPROVED AIR FLOW SPAN ADJUSTMENT
George C. Boyer, Rockford, Ill., assignor to Barber-Colman Company, Rockford, Ill.
Filed Dec. 14, 1981, Ser. No. 330,705
Int. Cl.³ F24F *13/10*
U.S. Cl. 236—49 **1 Claim**

1. A pneumatic controller of the reset type for providing a pneumatic control signal, said controller comprising a pneumatic control signal bleed nozzle, a flapper associated with said nozzle, a pressure differential-to-mechanical force transducer for applying a force tending to move said flapper in one direction relative to said nozzle, a bias member having a free end portion for applying a force tending to move said flapper in the opposite direction relative to said nozzle, the position of said flapper relative to said nozzle being determined by a balance of the opposed forces applied to said flapper, said pneumatic control signal varying as a function of the position of said flapper, a first pneumatic reset actuator for producing a first reset force as a function of a variable sensed condition to alter the force applied by said bias member to said flapper, a first pivotally mounted lever acted upon by said first reset force,

first bias means for applying force to said first lever in opposition to said first reset force whereby the angular position of said first lever is established by a balance of the latter two forces, a second pneumatic reset actuator for producing a second reset force as a function of a variable signal to re-alter the force applied by said bias member to said flapper, a second pivotally mounted lever acted upon by said second reset force, and second bias means for applying force to said second lever in opposition to said second reset force whereby the angular position of said second lever is established by a balance of the latter two forces, the improvement in said pneumatic controller comprising, a third pivotally mounted lever, means on said first lever and engageable with said third lever to cause said



third lever to swing in a direction opposite to the direction of swinging of said first lever, said last-mentioned means being selectively adjustable lengthwise of said first lever and also being adjustable transversely of said first lever and toward and away from said third lever, means on said second lever and engageable with said third lever to cause said third lever to swing in a direction opposite to the direction of swinging of said second lever, said last-mentioned means being selectively adjustable lengthwise of said second lever and also being adjustable transversely of said second lever and toward and away from said third lever, and means located between said third lever and said bias member for causing the force applied to said flapper by said bias member to change in response to a change in the position of said third lever.

4,413,777

RAIL CLIP AND AN ASSEMBLY ON A RAILWAY TRACK WHICH INCLUDES THE CLIP

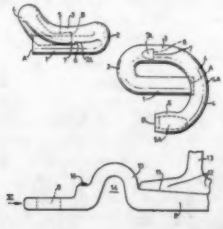
Trevor P. Brown, Orpington, England, assignor to Pandrol Limited, London, England

Filed Sep. 8, 1981, Ser. No. 299,953

Claims priority, application United Kingdom, Sep. 29, 1980, 8031392

Int. Cl.³ E01B 9/48

U.S. Cl. 238—349 **9 Claims**



1. A rail clip, for holding down a railway rail, comprising a rod of resilient metal, at least 8 mm. thick, which has been bent so that it comprises, proceeding from one end of the rod to the other end, a first portion which constitutes a substantially straight leg, a second portion in the form of a reverse bend, a third portion beside the first portion, a fourth portion in the form of a reverse bend and then a fifth portion which terminates at said other end of the rod and is beside the first portion, the configuration being such that when the clip is in a defined position in which the first portion is horizontal and the lowest points at opposite ends of the first portion lie in the same horizontal plane as one another and the lowest points on the third and fifth portions lie in the same horizontal plane as one another, a section of the fourth portion lies vertically above and cross-wise over the axis of the first portion and when the clip is viewed from above the third and fifth portions appear to be on opposite sides of the first portion, the clip further comprising, on the underside of its third portion when the clip is in the defined position, a step having a rising face which faces away from said one end of the rod.

4,413,778

ANTIQUE LAWN PUMP MOBILE

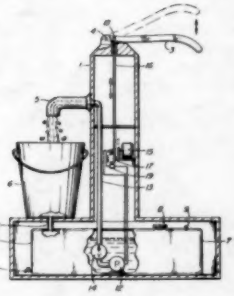
William S. Middlemiss, 332 - 7th SE., Swift Current, Canada (S9H 3P8)

Filed May 17, 1982, Ser. No. 378,609

Claims priority, application Canada, Jun. 25, 1981, 380635

Int. Cl.³ B05B 17/08

U.S. Cl. 239—17 **10 Claims**



1. A self contained fountain arrangement comprising:

(a) pump stand means including liquid reservoir means;

(b) elongate hollow pump body means mounted at one end thereof substantially perpendicularly on said stand means;

(c) pump handle means pivotally mounted, intermediate the ends thereof, on said pump body adjacent the free end thereof for oscillating movement in a plane parallel the longitudinal axis of said pump body;

(d) spout means projecting from said pump body means and spaced from said stand means;

(e) submersible pump means in said reservoir means to pump liquid to said spout means;

(f) motor means in said pump body operatively associated with said handle means so as to effect said oscillating movement; and

(g) means, associated with said handle means, to cyclically actuate and deactuate said pump means whereby liquid in said reservoir is pumped intermittently to said spout means in timed relation to said oscillating movement of said handle means.

4,413,779

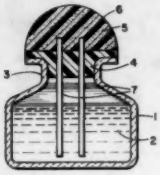
VAPOR DISPERSING DEVICE

Thomas F. Santini, New York, N.Y., assignor to De Laire, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 246,089, Mar. 23, 1981, abandoned. This application Apr. 30, 1981, Ser. No. 259,068

Int. Cl.³ A61L 9/04, 9/12

U.S. Cl. 239—45 7 Claims



1. A vapor dispersing device comprising a porous element having an open cell surface, and means for supplying to said surface an air treating liquid which has volatile and non-volatile components, said non-volatile component having a predetermined occluding rate on said open cell surface when said liquid evaporates therefrom, said open cell surface being initially impregnated, prior to supply of said liquid thereto, with an occluding agent which has a desired evaporation rate having a desired relation to said predetermined occluding rate, thereby to provide a desired evaporation rate of said liquid from said surface over an extended period of time.

4,413,780

FUEL INJECTION NOZZLES

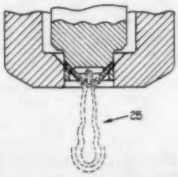
Robert T. J. Skinner, High Wycombe, and John W. Clegg, North Harrow, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Oct. 5, 1981, Ser. No. 308,597

Claims priority, application United Kingdom, Nov. 19, 1980, 8037091

Int. Cl.³ F02M 61/08

U.S. Cl. 239—533.4 10 Claims



1. A fuel injection nozzle for use with an internal combustion engine comprising a body having a fuel inlet which in use, is connected to a high pressure source of fuel, a resiliently loaded valve member slidable within the body, said valve member defining a surface against which the fuel under pressure can act to lift the valve member to an open position against the resilient loading to allow fuel flow to an outlet orifice, a bore extending through the body and connected with said inlet, the bore defining a reduced valve guide portion at its outer end, said valve member being located within said bore and having an outer end portion guided for movement by said valve guide portion, the valve member being loaded by said resilient means in an outward direction and said orifice being formed in the outer end portion of the valve member characterized in that the orifice comprises a single drilling the downstream end of which opens onto the exterior surface of said outer end portion of the valve member, the upstream end of the drilling being positioned to be covered by said valve guide portion of the bore in the closed position of the valve member, said upstream end of the drilling being progressively uncovered to the bore to permit flow of fuel through the orifice as the valve member moves to the open position.

4,413,781

FUEL INJECTION NOZZLE

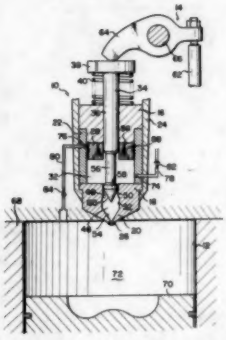
Masatoshi Iwata, Oyama, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Dec. 21, 1981, Ser. No. 332,736

Claims priority, application Japan, Dec. 22, 1980, 55-183182[U]; Dec. 22, 1980, 55-183183[U]

Int. Cl.³ F02M 67/04

U.S. Cl. 239—91 13 Claims



1. A fuel injection nozzle for the delivery of fuel, premixed with air, to the combustion chamber of a cylinder in an internal combustion engine, comprising:

(a) a nozzle body having formed therein an axial passage and at least one spray hole for communicating the axial passage with the combustion chamber of the engine cylinder;

(b) a piston slidably mounted in said nozzle body for reciprocating movement between a first and a second position and defining in combination therewith a first and a second chamber therein;

(c) said nozzle body having formed therein a fuel inlet port and an air inlet port, the fuel inlet port being open to the second chamber when said piston is in the first position and being closed when said piston is in the second position, the air inlet port being open to the first chamber when said piston is in the second position and being closed when said piston is in the first position;

(d) a valve member fixedly secured to said piston and therefore reciprocable in the axial passage of said nozzle body between the first and second positions for opening and closing the spray hole, the communication between the second chamber and the axial passage being blocked when said valve member is between the first position and a third position which is intermediate the first and second positions and being established when said valve member is between the second and third positions;

(e) conduit means for communicating the air inlet port with the combustion chamber; and

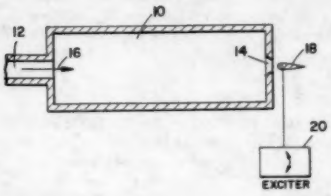
(f) means mounted in said piston for allowing the air flow from the first chamber to the second chamber but blocking the flow in the opposite direction.

4,413,782

JET EXCITATION BY AN OSCILLATING VANE

Maximilian F. Platzer, Pebble Beach, Calif., and John M. Simmons, Indooroopilly, Australia, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 18, 1980, Ser. No. 217,871
Int. Cl.³ B05B 3/14
U.S. Cl. 239—102 6 Claims



1. A device for enhancing mixing and entrainment of the central jet exhaust from a chamber with a medium surrounding said chamber comprising:

(a) a nozzle through which a turbulent jet stream flows;

(b) a vane having a leading and a trailing edge and situated just downstream from said nozzle in or near the core of said jet stream, said vane having winglike shape and spanning said nozzle, said vane having said leading edge blunter than said trailing edge; and

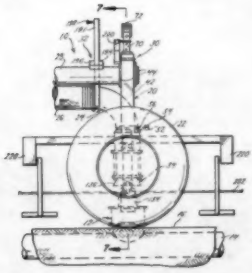
(c) means connected to said vane for causing said vane to oscillate about an axis through its span in pitch at a selectively variable amplitude and frequency about a zero angle of attack relative to said jet stream.

4,413,783

COUPLER FOR AN IRRIGATION SYSTEM

Carl R. Ostrom, Omaha, and Dennis R. Theilen, Fremont, both of Nebr., assignors to Valmont Industries, Inc., Valley, Nebr.

Continuation-in-part of Ser. No. 161,678, Jun. 23, 1980. This application Jul. 2, 1981, Ser. No. 279,771
Int. Cl.³ B05B 3/00
U.S. Cl. 239—183 34 Claims



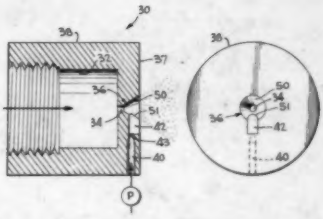
1. In an irrigation system having a liquid delivery apparatus for delivering liquid under pressure from a pressurized pipe line extending along the field to be irrigated to the irrigation system for dispensing the liquid onto the field, the pipe line having a series of connectors spaced along its length with valve means associated therewith, a coupler for connection with said connectors and for operating said valve means to deliver liquid from the pipe line to the irrigation system, said coupler comprising: a frame, a first member movable relative said frame for connection and disconnection of said coupler with a connector, valve operating means for operating said valve means between open and closed positions upon connection and disconnection of said coupler with said connector, a second member for engagement with said connector upon connection therewith, said first member extending relative said second member upon operation of said valve means between open and closed positions.

4,413,784

CONSTANT-OUTPUT ATOMIZER

Jack Y. Dea, Reno, Nev., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 2, 1981, Ser. No. 308,203
Int. Cl.³ B05B 7/08
U.S. Cl. 239—426 6 Claims



1. An improved constant-output atomizer comprising:

a body containing an air supply conduit;

an expansion nozzle formed in the wall of one end of said body, said expansion nozzle having a longitudinal axis, said nozzle comprising an exit orifice connected to said air supply conduit and a frustoconical diffuser section connecting said exit orifice to the outside surface of said end of said body, said frustoconical diffuser section widening from a narrow upstream end to a widened downstream end, said upstream end being contiguous with said exit orifice and of the same size as said exit orifice to form a smooth, continuous transition from said exit orifice to said frustoconical diffuser section;

a transverse groove cut in the surface of said end of said body, one end of said groove connecting with and extending into the side of said frustoconical diffuser section;

a liquid conduit formed in the wall of said one end of said body;

a metering pump connected to one end of said liquid conduit for moving liquid to said atomizer at a precise and constant rate;

an orifice for liquid connected to the opposite end of said liquid conduit, said liquid orifice connecting said liquid conduit to said transverse groove;

whereby liquid expelled from said orifice for liquid travels in a stream down the length of said transverse groove into said diffuser section where it combines with air expelled from said exit orifice and is atomized to produce a constant output.

4,413,785

VARIABLE PRESSURE FLUID CLEANING WAND

Carrol D. Engelbert, P.O. Box 1943, Walla Walla, Wash. 98362; Larry M. Muller, Nampa, and Dan E. Muller, Melba, both of Id., assignors to Carroll D. Engelbert, Walla Walla, Wash.

Filed Sep. 14, 1981, Ser. No. 302,226
Int. Cl.³ B05B 9/00
U.S. Cl. 239—443 8 Claims

5. A wand for delivery of pressure fluid comprising:

first high pressure conduit means adapted to be connected at an inlet end to a pressure fluid source, having an outlet end with means for delivering a high pressure fluid stream, and having a curved end portion adjacent its inlet end,

second low pressure conduit means arranged in parallel flow

relation with said first conduit means, said high and low pressure conduit means being in close proximity,

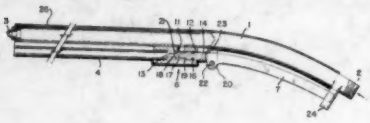
valve body means having a longitudinal through bore in axial alignment with and connected to an inlet end of said second conduit means,

fluid passage means in said valve body connecting said bore and said first conduit means and extending at right angles thereto,

a valve plunger extending axially in said bore and mounted for reciprocating movement therein,

first seal means acting between said valve plunger and said bore upstream from said fluid passage means,

said plunger extending externally of said valve body and being movable between a first open position to permit flow of pressure fluid from said fluid passage means through said bore and into said second conduit means and a second closed position wherein the end of said valve plunger is located downstream of said fluid passage means,



second seal means acting between said valve plunger and the walls of said bore downstream from said fluid passage means when the end of said plunger is located downstream of said fluid passage in said second position, and

selectively operable contact means operatively associated with said first conduit means and said valve body and pivotally mounted for movement toward and away from said first conduit means, said contact means including a handle portion extending close to, adjacent and in conforming curvature with said high pressure conduit means, said high pressure conduit means and said handle portion comprising an operating hand grip for said wand and being arranged to contact the external end of said valve plunger when moved toward said first conduit means for moving said valve plunger toward said second position and permitting return of said valve plunger toward said first position when released.

4,413,786

EMITTER UNIT

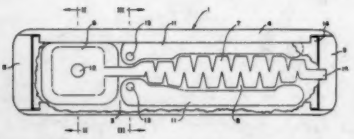
Raphael Mehoudar, Tel-Aviv, Israel, assignor to Hydro-Plan Engineering Ltd., Tel-Aviv, Israel

Filed Nov. 21, 1980, Ser. No. 209,306

Claims priority, application Israel, Nov. 21, 1979, 58773

Int. Cl.³ B05B *15/00*

U.S. Cl. 239—542 **6 Claims**



1. An emitter unit comprising a housing having defined therein an inlet and an outlet; a substantially planar inner wall portion having defined therein a groove, a recessed cavity communicating with one end of the groove and being of extended dimensions as compared with the width of the groove, a second and opposite end of the groove communicating with the inlet, an outlet bore in a base portion of the cavity communicating with said outlet and having a rim area substantially less than that of the cavity and at least one subsidiary recess; a resiliently flexible membrane juxtaposed with respect to the inner wall portion with one face thereof defining with the groove a flow restricting flowpath, with said cavity an outlet control chamber, and with the recess, at least one retaining cell, coupling means for coupling the cell with reduced pressure zones; the arrangement being such that, with the inlet coupled to a water supply, said membrane is exposed to the supply pressure and the membrane is displaceable towards and away from the base portion of the cavity in accordance with pressure variations so as to stabilize the output rate of the emitter unit with respect to the variations and a pressure differential is set up across said membrane in the vicinity of said cell(s) and chamber so as to ensure that said membrane is maintained in contact with said inner wall portion in the region of said groove.

4,413,787

APPARATUS FOR DRIP IRRIGATION

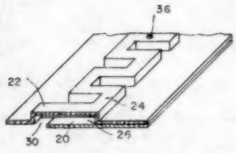
Gideon Gilead, 5 Nicaragua St., P.O.B. 26025, and Aviram Gilad, P.O. Box 26025, both of Jerusalem, Israel

Filed May 11, 1981, Ser. No. 262,509

Claims priority, application Israel, May 14, 1980, 60071

Int. Cl.³ B05B *15/00*

U.S. Cl. 239—542 **24 Claims**



1. Drip irrigation apparatus comprising:

at least one foil element including at least one first surface having a raised pattern formed thereon and defining a portion of a pressure reducing pathway; and

at least one second surface joined to said at least one first surface and defining therewith said pressure reducing pathway;

said at least one second surface being disposed in non-coextensive overlapping relationship with respect to said at least one first surface thereby having at least one portion of said raised pattern exposed so as to define at least one water pathway between the interior and exterior of said pressure reducing pathway.

4,413,788

DEVICE FOR THE FEEDING OF ENAMEL TO AN ELECTROSTATIC PAINT EMITTER

Gerd Schaefer, Heusenstamm; Winfried Ott, Rodgau, and Gunther Fleig, Hanau, all of Fed. Rep. of Germany, assignors to Ransburg GmbH, Heusenstamm, Fed. Rep. of Germany

Filed Sep. 18, 1980, Ser. No. 188,514

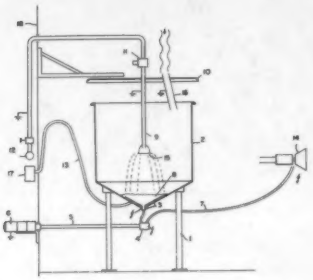
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1979, 2937890

Int. Cl.³ B05B *5/02*

U.S. Cl. 239—703 **9 Claims**

1. A device for feeding an electrically conductive coating material from a supply system to a coating material dispensing device wherein a high electrostatic potential is maintained between the supply system and the device, comprising an intermediate storage container fillable in controlled manner from the supply system to a maximum fill level and connected to the coating material dispensing device by a coating material conduit maintained at substantially the electrostatic potential of the coating material dispensing device, a device provided in the intermediate storage container for breaking up the supply of coating material into the intermediate storage container into electrically separated individual particles, and means for coupling the breakup device to a source of coating material, the

breakup device being arranged above the fill level such that, between the breakup device and the interior of the intermediate storage container, a minimum spacing in maintained so that no electrostatic discharge occurs, the intermediate storage container being dimensioned so that the coating material flow discharging from a delivery tube into the interior of the intermediate storage container flows freely in the form of an unconstrained column or large drops if no potential difference exists between the intermediate storage container and the delivery tube, but is broken up into individual drops which proceed somewhat along the electric flux lines established with the container as a potential difference is established, and while such potential difference exists, between the intermediate storage container and the delivery tube.



4,413,789

ROTOR FOR A PULPER

Reimund Rienecker, Heidenheim-Mergelstetten, and Walter Stricker, Aalen, both of Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Jul. 17, 1981, Ser. No. 284,407

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1980, 3027044

Int. Cl.³ B02C *23/36*

U.S. Cl. 241—46.17 **15 Claims**

1. A rotor for a pulper for forming a pulp suspension, wherein the rotor is mounted in the wall of a pulping container, the rotor comprising:

a generally conically shaped rotor body extending from a wider bottom to a narrower tip;

a helically wound conveyor element defined on and winding up along the rotor body from the bottom to the tip, the conveyor element being generally flat and including a surface extending out from the rotor body to a peripheral edge of the conveying element;

an additional vane located in the vicinity of the bottom of the rotor and extending generally radially outward from the peripheral edge of the conveyor element, and extending a short distance along the length of the conveyor element from the end of the conveyor element at the bottom of the rotor; the additional vane being oriented to extend generally close to perpendicular to the axis of the rotor.

4,413,790

MIXER FOR BULK MATERIALS, ESPECIALLY FOR FIBROUS SUSPENSIONS

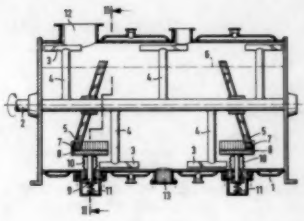
Eberhard Lipp, Straubenhardt, Fed. Rep. of Germany, assignor to Draiswerke GmbH, Mannheim, Fed. Rep. of Germany

Filed Oct. 1, 1981, Ser. No. 307,424

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1980, 3037332

Int. Cl.³ B02C *15/00*

U.S. Cl. 241—101 B **12 Claims**



1. A mixer for bulk material, especially for fibrous suspensions, such as cellulose derivations, comprising a horizontally disposed trough-drum-shaped housing, an axially disposed shaft mounted for rotation within said housing, radially disposed support brackets and mixing blades mounted on said shaft for rotation therewith, at least one milling rim disposed for rotation with said shaft in spaced axial position with respect to said support brackets and mixing blades, said milling rim being mounted in a slanting plane with respect to the longitudinal axis of said shaft to carry out a tumbling motion by rotation, said milling rim being formed of a disk attached to said shaft, a milling stator adjustably mounted in said housing for milling engagement with a peripheral surface of said milling rim, said milling stator having a cylinder-part surface cooperating with a peripheral surface of said disk, and a support for engaging said cylinder-part surface of said milling stator, the support being adjustable from the outside of said housing, said cylinder-part surface being arranged in said housing such that at least one side of each of the mixing blades can be conducted beneath it.

4,413,791

GLASS FIBER STRAND WINDING APPARATUS

Yutaka Kawaguchi; Michio Sato, and Shin Kasai, all of Fukushima, Japan, assignors to Nitto Boseki Co., Ltd., Fukushima, Japan

Filed Apr. 19, 1982, Ser. No. 369,978

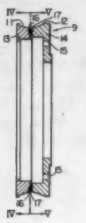
Claims priority, application Japan, Apr. 22, 1981, 56/60774

Int. Cl.³ B65H *54/02, 67/04, 75/28*

U.S. Cl. 242—18 G **5 Claims**

1. A glass fiber strand winding apparatus having a rotatable turret and at least two winding collets mounted at one end thereof on said turret, each said collet being provided at the other end with a waste strand winding portion, wherein said waste strand winding portion is formed with a frusto-conical strand guide surface disposed coaxially with said collet and having the smaller-diameter end thereof on the side remote from said turret, an annular strand stopping wall radially outwardly extending from the smaller-diameter end of said guide surface, a plurality of parallel grooves formed on at least one crescent-shaped wall surface area extending radially inwardly from a portion of the outer periphery at the smaller-diameter end of said guide surface, the grooves extending at a right

angle to the diameter of said guide surface, and a crescent-shaped flat portion extending from a portion of the outer periphery of said stopping wall in confronting spaced relationship with said crescent-shaped wall surface area.



4,413,792

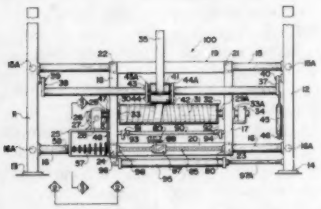
APPARATUS FOR AUTOMATIC TRAVERSE WINDING OF TAPES ON A CYLINDRICAL CORE

Lawrence O'Connor, P.O. Box 489, Lot 6, Clearwater Bay, Keewatin, Ontario, Canada P0X 1C0

Continuation-in-part of Ser. No. 71,989, Sep. 4, 1979, abandoned. This application Jul. 27, 1981, Ser. No. 287,201

Int. Cl.³ B65H *17/02, 54/28*

U.S. Cl. 242—67.1 R **17 Claims**



1. Apparatus for traverse winding of flat tape on a cylindrical core comprising a supporting framework, a traverse carriage mounted for side to side reciprocation upon said supporting framework, means to detachably mount the cylindrical core on said carriage, means for applying a predetermined rotational force to the core to rotate the core and wind the tape thereon under a predetermined tension, means for applying a motive force to said carriage to cause reciprocatory movement thereof and means for controlling the speed of reciprocatory movement of the carriage said speed controlling means being separate from and independent of said motive force applying means and including lead screw means journalled on said carriage, means for rotating the lead screw means in dependence upon the rotation of the core and nut means operatively carried on said lead screw means and attached to said framework whereby the lead screw means acts to control the speed of reciprocatory movement substantially without the application of force thereto.

4,413,793

CASSETTE TAPE MACHINE

Masahiro Komatsubara; Tetsuro Kamimura; Takugi Inanaga, and Akira Takahashi, all of Kawagoe, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

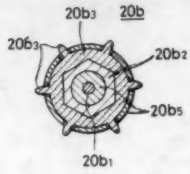
Filed Dec. 28, 1981, Ser. No. 335,035

Claims priority, application Japan, Dec. 26, 1980, 55-186650[U]; Dec. 29, 1980, 55-187922[U]

Int. Cl.³ G11B *15/32*

U.S. Cl. 242—68 **2 Claims**

1. In a cassette tape machine having a rotatable reel shaft unit with at least one engagement projection on its outer periphery having a contact surface for engaging a reel in a cassette tape whereby said reel rotates said shaft unit in a supply direction, the improvement characterized in that said shaft unit includes a hub of a viscous elastic material having a plurality of viscous elastic engagement projections, and a plastic member covering said hub and having a slit therein for exposing said engagement projection to said reel.



4,413,794

LOCKING DEVICE REACTING TO INERTIA FORCES FOR RETRACTORS

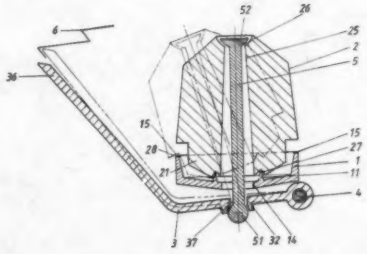
Per O. Weman, Heverlee, Belgium, assignor to N.V. Klippan S.A., Heverlee-Leuven, Belgium

Filed Nov. 30, 1981, Ser. No. 325,882

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1980, 3049255

Int. Cl.³ B65H *75/48*

U.S. Cl. 242—107.4 A **3 Claims**



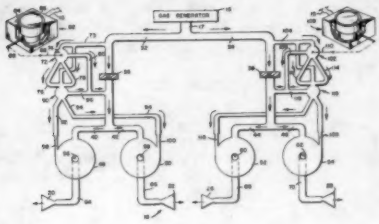
1. For use with a safety belt retractor having a housing and a ratchet wheel, a locking mechanism which is responsive to the attitude and to the acceleration of a vehicle comprising a support having an inner upstanding annular flange and an outer upstanding annular flange, a pawl disposed below said support, pivotally connected to the housing and movable into engagement with the ratchet wheel, an inertia body disposed above said support and including an annular groove and an annular shoulder, said insertia body being carried by said support so that said inner flange engages said groove, and a rod connected to said pawl and said inertia body so that tilting movement of said inertia body about said inner flange causes a pivotal movement of said pawl, said tilting movement of said inertia body being limited by contact of said shoulder with said outer flange.

4,413,795

FLUIDIC THRUSTER CONTROL AND METHOD

William F. Ryan, Phoenix, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Sep. 5, 1980, Ser. No. 184,604
Int. Cl.³ F42B 15/02
U.S. Cl. 244—3.22 17 Claims



2. A fluidic system for porportionally controlling warm gas flow through a pair of thrust nozzles, comprising:

passage means for delivering gas flow from a source to said first and second thrust nozzles in parallel flow arrangement;

a pair of fluidic vortex valves each having control ports for receiving proportional fluid signals and being operable to proportionally vary the rates of flow of warm gas through each of said thrust nozzles in relation to said fluid signals whereby the total flow through both of said nozzles remains substantially constant;

a flow restrictor interposed in said passage means upstream of said pair of vortex valves for producing a pressure differential across said flow restrictor;

a fluidic jet interaction device having an input port and vent port respectively communicating with said passage means upstream and downstream of said flow restrictor whereby said pressure differential is impressed across said device to maintain subsonic conditions therein, said device having a pair of output ports operably communicating with said control ports of said pair of vortex valves; and

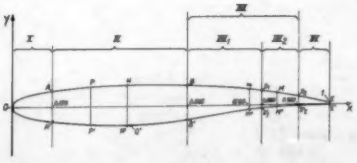
control means for proportionally varying flow from said input port between said pair of output ports to develop said proportional fluid signals therein.

4,413,796

AIRFOIL SHAPE FOR AIRCRAFT

Jean Bousquet, Blagnac, France, assignor to Societe Nationale Industrielle et Aerospatiale, Paris, France

Continuation of Ser. No. 11,156, Feb. 12, 1979, abandoned. This application Aug. 14, 1981, Ser. No. 292,837
Claims priority, application France, May 29, 1978, 78 15926
Int. Cl.³ B64C 3/26
U.S. Cl. 244—35 R 18 Claims



1. An airfoil for flight at high subsonic speeds, comprising a thick leading edge, a trailing edge, a convex upper surface, and a lower surface which is convex towards the leading edge and concave towards the trailing edge, wherein said upper surface comprises a point of maximum convex curvature within a first zone extending from 65% to 90% of the chord of the airfoil from said leading edge, the thickness of the airfoil at said point of maximum convex curvature being about three-tenths of the maximum thickness thereof, and wherein the lower surface comprises a point of maximum concave curvature in an intermediate zone extending from 70% to 93% of the chord of the airfoil from the leading edge, and, at said point of maximum concave curvature, the thickness of the airfoil is about half the maximum thickness thereof;

said lower surface, in a zone adjacent its trailing edge, being represented by the formula

$$Y = e_{max}(-0.538X^{3/2} + 2.186X^3 - 1.648)$$

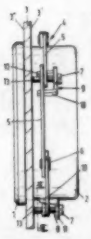
wherein e_{max} represents the maximum thickness of the airfoil and X has the values $0.846 < x < 1$, when related to a coordinate system having an origin O and rectangular axes OX,OY on which are respectively plotted reduced abscissae X and ordinates Y defining the airfoil, the origin O being located at the leading edge and the axis OX coinciding with the chord of the airfoil.

4,413,797

CLAMPING RING

Dorotheus Donkervoort, Vlaardingen, Netherlands, assignor to Eerste Nederlandse Fabriek van Manometers B.V., Netherlands

Filed Mar. 16, 1981, Ser. No. 244,114
Claims priority, application Netherlands, Jun. 3, 1980, 8003238
Int. Cl.³ G12B 9/00
U.S. Cl. 248—27.1 6 Claims



1. An attachment means for an article recessed in a wall element, in particular an article projecting through a panel opening, said attachment means being adapted to fix the article in a stationary axial position relative to the panel by engagement on an article portion projecting from the other side of the panel, in coaction with stopping devices operative on the panel, characterized in that the attachment means comprises an undivided clamping ring which fits with clearance about the article portion projecting through the panel, circumferentially spaced clamping elements thereon adjustable axially relative to the ring and operative at the inner edge of the ring, and adjusting elements for defining the axial position of the clamping ring relative to the rear wall of the panel, said clamping ring comprising ring zones situated circumferentially between the clamping elements having a smaller bending stiffness than at the clamping elements.

4,413,798

AUTOMOTIVE VEHICLE PARTS AND FITTING STRUCTURE THEREFOR

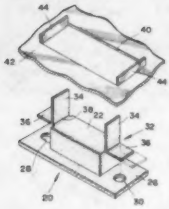
Takeo Tamura, Yokohama, and Mamoru Imai, Fujisawa, both of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Dec. 11, 1981, Ser. No. 329,876

Claims priority, application Japan, Dec. 18, 1980, 55-182326[U]

Int. Cl.³ G12B *9/00*

U.S. Cl. 248—27.1 **12 Claims**



1. An automotive vehicle part to be installed onto a vehicle panel for mounting vehicle equipment such as a room lamp, comprising:

a container having an open-ended chamber for receiving said vehicle equipment;

a flange laterally extending from the periphery of said container and having an opening for receiving a fastener for fixing the flange onto said vehicle panel, said flange constituting a part body in conjunction with said container; and

a fastener cover opposite said fastener for covering at least the end of the fastener, said fastener cover including a flexible hinge, first and second plane sections connected at a right angle, and rotatable about a hinge axis of said hinge between a first position in which said first section is positioned perpendicularly with respect to said panel and said second section is parallel to the flange, and a second position in which said second section is parallel to the flange and extends over said fastener and said first section is aligned perpendicular to said flange.

4,413,799

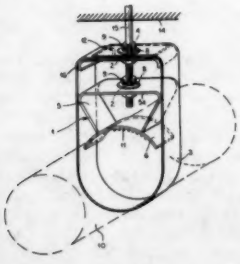
DEVICE FOR FASTENING ELONGATED SYNTHETIC RESIN PROFILES

Fredy Gabriel, Reussbühl, Switzerland, assignor to Stapro AG, Lucerne, Switzerland

Filed Jul. 9, 1981, Ser. No. 281,645

Int. Cl.³ F16L *3/16*

U.S. Cl. 248—59 **13 Claims**



1. A device for mounting an elongated member upon a structure which comprises:

a threaded rod affixed to said structure;

a support bar adjustably mounted on and fixed to said rod;

a strap having its opposite ends connected to said support bar and reaching around one side of said member; and

a shoe adjustably mounted on said rod independently of said bar and reaching toward the opposite side of said member and juxtaposed with said opposite side whereby said member is retained between said shoe and said strap with at least limited freedom of longitudinal sliding displacement and transverse expansibility, said shoe having at least a pair of angularly adjoining portions one of which is adjustably fixed to said rod while another bears upon said member via a foot.

4,413,800

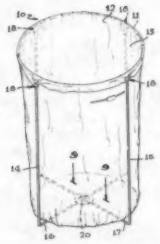
TRASH BAG CADDY

Arthur F. Kelson, 11701 Foster Rd., Los Alamitos, Calif. 90720

Filed May 19, 1982, Ser. No. 379,646

Int. Cl.³ B65B *67/04*

U.S. Cl. 248—99 **7 Claims**



1. A trash bag caddy comprising the combination of:

a trash bag composed of a pliable, resilient material having a tubular body closed at one end and open at its other end;

said bag having an edge marginal region at said open end defining an entrance leading into the interior of said bag;

a circular rigid ring disposed at said open end of said bag and said bag edge marginal region being folded over said ring so that said ring rigidizes said bag entrance;

a vertical supporting structure for said trash bag;

snap-lock socket means releasably interconnecting said supporting structure with said ring for releasably holding said bag therefrom in a fully supported manner;

said vertical supporting structure includes a pair of U-shaped leg members having central sections cross over upon themselves at a right angle;

said supporting structure further includes upright leg sections at each end of each of said central sections;

said socket means releasably engaging with the terminating ends of each of said upright leg sections; and

a retaining socket means releasably engaged with said central sections at their cross-over point.

4,413,801

LADDER RACK

Paul B. Lancaster, 8451 Elliot Ave. South, Bloomington, Minn. 55420, and Gordon A. Huisentruit, 3120 Pilot Knob Rd., Eagan, Minn. 55122

Filed Mar. 13, 1981, Ser. No. 243,456

Int. Cl.³ A47F *5/00*

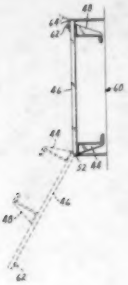
U.S. Cl. 248—316 A **8 Claims**

1. A ladder rack comprising:

(a) an elongated based member having end edges which is pivotably attached about an axis parallel to said edge at one end thereof to a mounting bracket,

(b) a first hook member secured to said base member near one end thereof,

(c) a second hook member carried on the opposite end of said base member, said second hook member including a



moveable seat which is normally biased toward said first hook member.

4,413,802

DEVICE FOR HOLDING AN OBJECT ON A SMOOTH SHELF SURFACE

Avraham Fishman, Klosbachstrasse 110, CH-8032 Zurich, Switzerland

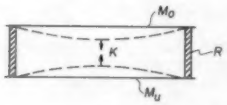
PCT No. PCT/CH79/00152, § 371 Date Aug. 1, 1980, § 102(e) Date Jul. 21, 1980, PCT Pub. No. WO80/01192, PCT Pub. Date Jun. 12, 1980

PCT Filed Nov. 29, 1979, Ser. No. 197,347

Claims priority, application Switzerland, Dec. 1, 1978, 12302/78

Int. Cl.³ A45D *42/14*

U.S. Cl. 248—362 **8 Claims**



1. A device for resting on and holding an object on a smooth surface by a suction gripping effect, comprising:

(a) two resilient membranes made of nonslipping elastic material disposed in superposed parallel spaced relation,

(b) supporting ring means consisting of a continuous ring disposed along the periphery of each of the resilient membranes and extending therebetween for maintaining the membranes in parallel spaced relation and for permitting relative rotational movement of the membranes with respect to each other,

(c) elongated center connecting means connected between the central sections of the membranes and having two interconnected relatively movable connecting elements which are axially and rotationally movable with respect to each other for permitting relative rotational movement between the membranes,

(d) at least one of the said means having elements for providing axial displacement such that the axial extent of the ring means is relatively greater than that of the center means so as to bring about a collapse of the two membrane central sections toward one another when the membranes are relatively rotated, and

(e) at least one of the means also having stop means thereon for limiting relative rotation between the membranes to a predetermined angular rotation whereby when an object having a flat bottom larger than the diameter of the top membrane is placed thereon and rotated, the membranes collapse to a desired point producing sufficient suction between the object and the supporting surface to firmly hold the items in a fixed position on the supporting surface.

4,413,803

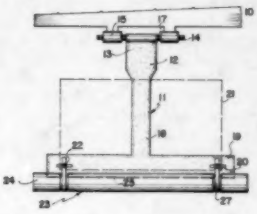
PIVOTING LICENSE PLATE BRACKET

William Ross, P.O. Box 51, Vermilion Bay, Canada P0V 2V0

Filed Jun. 4, 1981, Ser. No. 270,586

Int. Cl.³ A47F *7/14*

U.S. Cl. 248—475 B **12 Claims**



1. A license plate holder for trailers and the like which include plate holder support means thereon; said license plate holder comprising in combination a license plate bracket, means for pivotally supporting the license plate bracket from the support means for fore and aft swinging movement relative to the trailer and means on the underside edge of said license plate bracket to protect said lower edge upon engagement of same means on said underside edge with the ground surface, said means on said underside edge including at least one roller journalled for rotation to adjacent the lower side of said bracket with the underside of said roller being below the lower edge of said bracket and means to secure said roller to said bracket for free rotation relative to said bracket.

4,413,804

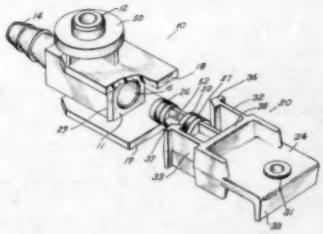
PISTON VALVE AND FUEL TANK ASSEMBLY

Charles A. Lanius, Prairie du Sac; Harold D. Hulterstrum, and Gerald A. Rau, both of Baraboo, all of Wis., assignors to Flambeau Product Corporation, Baraboo, Wis.

Filed Jul. 15, 1981, Ser. No. 283,570

Int. Cl.³ F16K *51/00*

U.S. Cl. 251—144 **14 Claims**



1. A piston valve comprising, in combination:

a housing having a rear face, an intake port, an exhaust port, at least one stop mounted on said housing, and a flow channel extending through the interior thereof from said intake port to said exhaust port, said flow channel defining an intake channel adjacent to said intake port and an exhaust channel adjacent to said exhaust port and in fluid communication with said intake channel, said housing further defining a piston channel having a first end and a second end, said first end adjacent to and in fluid commu-

nication with said flow channel and said second end extending through said housing forming an opening in said rear face thereof;

a piston having a butt, a bedplate at one end of said butt, a shaft extending perpendicularly from said bedplate and having a diameter less than that of said piston channel, and arms extending from said bedplate and laterally disposed on either side of said shaft, at least one of said arms having a latch on the end thereof, said piston being slidably engaged within said housing and extending therefrom through said opening in said rear face thereof, said shaft being disposed near the first end of said piston channel for sliding into said flow channel when the valve is in the off position, and said butt being disposed near the second end of said piston channel near said opening and extending therefrom, said latch on said arm and said stop on said housing defining means to limit the outward movement of said piston relative to said housing, when said latch engages said stop, and wherein the length of said shaft corresponding to the length of said arms defining means for maintaining said piston channel sealing means in sealing engagement within said piston channel when said piston has been outwardly slid to the point where said latch engages said stop;

flow channel sealing means for sealing said flow channel when said piston is slid into said flow channel when the valve is in the off position; and

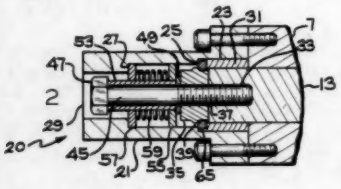
piston channel sealing means for sealing said piston channel.

4,413,805

VALVE DETENT

Robert H. Green, 17518 Euler Rd., Bowling Green, Ohio 43402, and James D. Simon, 10410 S. Dixie Hwy., Portage, Ohio 43451

Filed Jun. 18, 1981, Ser. No. 274,749
Int. Cl.³ F15B *13/01*
U.S. Cl. 251—297 **12 Claims**



1. A detent for maintaining a valve body of a valve in a preselected position comprising:

an outer housing for said valve;

a valve body slideably positioned in said outer housing;

a raised diameter section located on and extending around the outer periphery of said valve body;

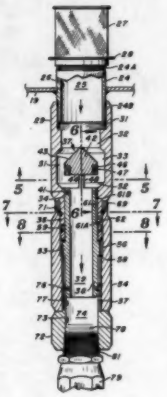
a resilient ring shaped detent member positioned around substantially the entire outer periphery of said valve body, said ring having a first end and a second end, said first and second ends being disposed to facilitate expansion of said ring to engage said raised diameter section on said valve body, said detent member having a diameter greater than the diameter of said valve body and less than the diameter of said raised diameter section, said entire detent member being spaced apart from said valve body to allow said valve body to freely slide in said outer housing when said valve body is in a position other than said preselected position, said detent member positioned to resiliently engage substantially the entire outer periphery of said raised diameter section when said valve body is in said preselected position whereby the engagement of said raised diameter section by said detent member maintains said valve body in said preselected position.

4,413,806

SHUT-OFF VALVE ASSEMBLY

Glenys Anderson, 4820 Yorktown Lane North, Minneapolis, Minn. 55442

Filed Jul. 29, 1981, Ser. No. 288,063
Int. Cl.³ F61K *31/44*
U.S. Cl. 251—340 **31 Claims**



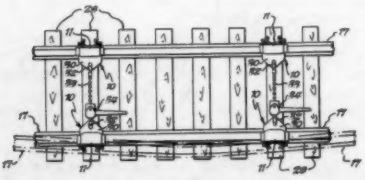
1. A shut-off valve assembly comprising: a body having a chamber, a first portion having a fluid inlet passage open to the chamber, and a second portion having an inside wall providing a fluid outlet opening to the chamber, valving means movably mounted on said inside wall for selectively opening and closing said fluid outlet, said valving means including a tubular member movably mounted on said inside wall, said tubular member having a fluid outlet passage open to the chamber when the valving means is in the open position, and head means connected to said tubular member and movable with said tubular member to an open position in said chamber and to a closed position in engagement with said inside wall to block the flow of fluid through said fluid outlet passage, means mounted on said second portion of the body operable to move the valving means to its open and closed positions, and annular elastic means engageable with said body and tubular member operable to hold the tubular member in the open position, said tubular body having an outwardly directed rim, and said annular elastic means being engageable with said rim and second portion of the body when the tubular member is in the open position.

4,413,807

RAIL GAUGING SHOE

Edwin R. Winter, Rte. 75 and Shirley Rd., North Collins, N.Y. 14111

Filed Sep. 28, 1981, Ser. No. 305,936
Int. Cl.³ B25B *1/20*
U.S. Cl. 254—43 **10 Claims**



1. A rail gauging shoe for mounting on a deformed rail of a pair of railroad tracks to pull it back into proper gauged posi-

tion relative to the other rail of said pair of railroad tracks and which can remain in position to permit train wheels to pass along the deformed rail and over the rail gauging shoe comprising a body portion, an elongated flat top portion on said body portion for placement in contiguous abutting relationship to the top of said deformed rail, an elongated first side portion extending transversely to said top portion for placement in contiguous relationship to the side of said deformed rail facing said other rail of said pair of railroad tracks, first chamfered portions at the ends of said top portion, second chamfered portions at the ends of said first side portion, a second side portion extending transversely to said top portion on the opposite side thereof from said first side portion, first attachment means on said second side portion for securing said body portion to said rail with said first side portion in abutting relationship to said rail, and second attachment means on said first side portion for attachment to a pulling device.

4,413,808

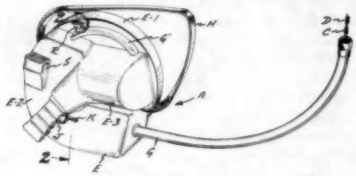
PORTABLE POWER DRIVEN WIRE PULLER

Louis J. Finkle, 9300 Palm St., Bellflower, Calif.

Continuation of Ser. No. 148,740, May 12, 1980, abandoned. This application Dec. 10, 1980, Ser. No. 215,045

Int. Cl.³ B65H *57/28*

U.S. Cl. 254—134.3 FT **8 Claims**



1. In combination with an elongate stiff, resilient steel tape having means on a first end thereof to which a length of wire may be secured to be pulled through a conduit, a portable power driven wire pulling device that may be used by an operator to push said tape through a conduit to have an end of said wire secured thereto and then retract said tape substantially into said device to pull said wire through said conduit, said wire pulling device including:

a. a housing;

b. a free floating tape storage cage rotatably supported in said housing and having a portion of said tape coiled therein;

c. a reversible drive motor operatively associated with said housing;

d. at least one pair of rotatably gripping members in said housing that pressure contact opposite sides of said tape;

e. first and second gear trains in said housing in driving connection with said motor for selectively driving said gripping members in first or second directions; and

f. first means that automatically impart rotation to said pair of gripping members through said first gear train when said motor rotates in a first direction to withdraw said tape from said free floating cage and push said tape into said conduit, and said first means when said motor operates in said second direction imparting rotation to said pair of gripping members through said second gear train in a second direction to draw said tape and wire from said conduit and direct said tape into said free floating cage to assume a coiled configuration therein.

4,413,809

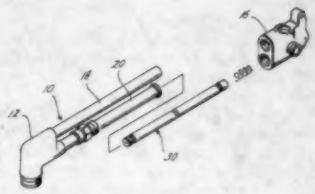
ANTI-FLASHBACK CUTTING TORCH

Robert A. Fischer, 1903 Ave. C., Katy, Tex. 77449

Filed Sep. 24, 1982, Ser. No. 423,363

Int. Cl.³ B23K *7/00*

U.S. Cl. 266—48 **2 Claims**



1. In a cutting torch having a torch head, a body having a fuel inlet and oxygen inlet, control means connected to the body for controlling the flow of fuel and oxygen, a preheat tube assembly and a cutting oxygen tube assembly connected between the body and the head, the improvement in the preheat tube assembly for preventing flashback comprising,

an inner tubular member positioned in the preheat tube assembly,

said member being threadably connected at one end to the head,

the outer surface of the tubular member spaced from the inner surface of the preheat tube forming a fuel passageway in communication with the fuel,

said means at each end of the tubular member blocking said passageway ends,

said tubular member having a straight through bore with the body end of the bore being in communication with the oxygen,

said member having one or more holes extending from the passageway to the bore intermediate the ends of the member for aspirating fuel from the passageway into the bore as oxygen flows through the bore to the head.

4,413,810

ASCERTAINING THE LEVEL OF THE SLAG-LIQUID-METAL INTERFACE IN METALLURGICAL VESSELS

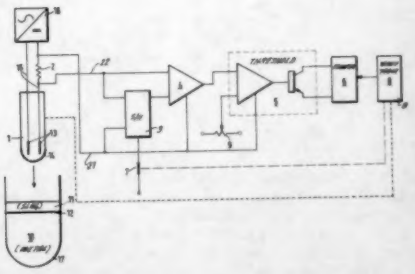
Werner Tenberg, Ratingen, and Ludwig Pichert, Duisburg, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Aug. 16, 1982, Ser. No. 408,510

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1981, 3133182

Int. Cl.³ C21C *5/30*

U.S. Cl. 266—94 **3 Claims**



1. Apparatus for ascertaining the surface level of the liquid

metal in a metallurgical vessel and interfacing with a slag layer, the apparatus including a two-electrode probe interconnected externally in an electric circuit that includes a voltage source, there being means for lowering the probe, including the two electrodes, into the vessel and raising and lifting the probe again, the improvement comprising:

circuit means connected to the probe to derive therefrom a voltage being representative of any current flow between the electrodes;

an analog storage device having an input connected to receive said voltage and having an output tracking the input, and including switch means for selectively enabling and interrupting the tracking;

means responsive to lifting of the probe and connected for causing said interrupting so that the output of the analog storage device equals a value of the input prior to the interrupting, representing a current flow between the electrodes as interconnected by the liquid metal in the vessel;

a differential amplifier having an input connected to receive said voltage as provided by the circuit means and having a second input connected to receive said output of said analog storage device;

a threshold circuit connected to receive an output of the amplifier and having an adjustable circuit for adjustment of a threshold level; and

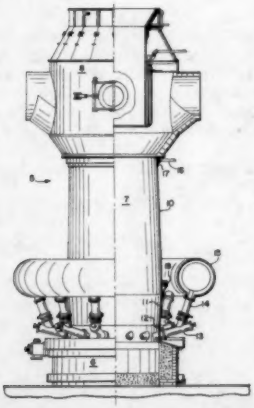
a counter connected and operated for counting path increments for, thereby, tracking the lowering and/or lifting of the probe, further being connected for changing as between counting and not counting in response to the output of the threshold circuit then indicating that the output of the differential amplifier has exceeded the threshold level as adjusted in the threshold circuit.

4,413,811

WATER-COOLED, LININGLESS CUPOLA

William A. VanDril, Frankfort, Ill., assignor to Whiting Corporation, Harvey, Ill.

Filed Jun. 17, 1982, Ser. No. 389,422
Int. Cl.³ F27B *1/24*
U.S. Cl. 266—190 **5 Claims**



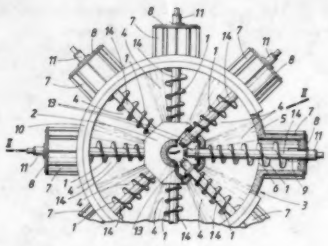
1. In a water-cooled, liningless cupola having a water-cooled liningless body section which extends downwardly from the bottom of the cupola gas take-off section to the top of the cupola well section, with the lower portion of said body section including the high heat area above the tuyeres tapering inwardly toward the bottom of the body section with respect to its vertical axis, the improvement which comprises having said inward taper terminate a short distance above the cupola tuyeres with the remaining bottom end portion of said body section being cylindrical or outwardly tapered.

4,413,812

APPARATUS FOR DISCHARGING HOT FLOWABLE SOLIDS, PARTICULARLY SPONGE IRON, FROM A SHAFT FURNACE

Wilfried Pirklbauer, Linz, and Martin Nagl, Rutzenmoos, both of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Dec. 20, 1982, Ser. No. 451,043
Claims priority, application Austria, Jan. 11, 1982, 50/82
Int. Cl.³ F27B *1/20*
U.S. Cl. 266—195 **10 Claims**



1. In apparatus for discharging hot flowable solids from a shaft furnace, comprising

a centrally disposed hollow body,

a plurality of conical conveyor screws arranged to form a star-shaped array and having an inner end each, which is rotatably mounted in said hollow body, and

a bottom structure comprising a plurality of conveyor troughs, each of which contains one of said conveyor screws,

the improvement residing in that

said bottom structure comprises said hollow body and an annular mounting flange,

each of said conveyor troughs has a largest depth which is at least as large as the largest diameter of the associated conveyor screw,

each of said conveyor troughs has an outer end wall formed with an opening, through which the associated conveyor screw extends, and

each of said outer end walls carries a gas-tight discharge housing, which is provided with a discharge fitting and contains the outer end of the associated conveyor screw.

4,413,813

DISPOSABLE BED FILTER APPARATUS

Michael J. Pryor, Woodbridge, Conn., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 200,342, Oct. 24, 1980, Pat. No. 4,330,327. This application Jan. 25, 1982, Ser. No. 342,433
Int. Cl.³ C21C *7/04*; B01D *23/20, 23/24*
U.S. Cl. 266—216 **22 Claims**

1. A filter apparatus for removing impurities from a molten metal comprising:

a trough for conveying a flow of said molten metal in a desired direction, said trough being sump-free;

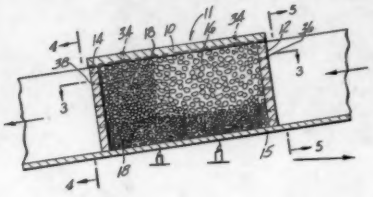
a bed filter for removing the impurities in the molten metal located within the confines of said sump-free trough;

said bed filter comprising layers of different sized bed media overlapped longitudinally in the direction of said molten metal flow and having a cross-sectional area substantially transverse to said molten metal flow direction;

said layers being overlapped longitudinally for substantially preventing channelling in said bed filter and for increasing

molten metal flow through substantially all of said cross-sectional area; and

perforated means for assisting in substantially preventing



said channelling in said bed filter and for increasing said flow through substantially all of said cross-sectional area, said perforated means being located adjacent an exit portion of said bed filter.

4,413,814

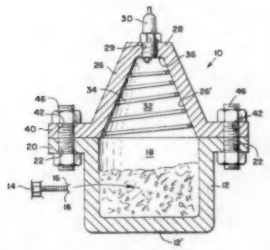
INITIATING CONE

George S. Lobastov, 495 - 45th Ave., San Francisco, Calif. 94121

Filed Apr. 10, 1981, Ser. No. 252,998

Int. Cl.³ B23K 7/00; B24C 1/00; C21D 1/82

U.S. Cl. 266—251 5 Claims



1. A detonation device for removing burrs from metallic articles comprising:

a receptacle having an open upper end and a hollow interior for receiving the metallic articles;

a combustion chamber casing, connectable to the open upper end of said receptacle in sealing engagement therewith, said casing having a hollow cavity in communication with the interior of said receptacle, said cavity having a generally frusto-conical configuration with the interior surface of said cavity being formed with a spiral pattern; and

ignition means mounted adjacent the upper end of said cavity for igniting a combustible material introduced into said cavity, whereby in operation, the configuration of the inner surface of said cavity functions to enhance detonation of said combustible material to aid in the removal of burrs from the metallic articles held in the receptacle.

4,413,815

DEVICE FOR BLOWING SWIRLING GAS INTO A METAL REFINERY CONVERTER

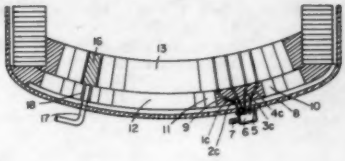
Roger Dubomez, and Guy Quenton, both of Dunkerque, France, assignors to Compagnie Francaise des Aciers Speciaux, Paris, France

Filed Apr. 21, 1982, Ser. No. 370,652

Claims priority, application France, Apr. 24, 1981, 81 08188

Int. Cl.³ C21B 7/16

U.S. Cl. 266—265 7 Claims



1. A device for blowing swirling gas through the compact refractory coating of the bottom wall of a converter for refining liquid metals and having a compact refractory coating, consisting of a set of single tube tuyeres, located throughout the entire thickness of said compact refractory coating and wearing away with said coating, the tube constituting each of the said tuyeres being flattened along the whole consumable length (1*b*) of said tuyere, the width of the internal cross-section for the passage of the gas in the flattened tube (1*b*) being, at most, equal to 1.0 mm, the head (1*a*) of each of said tubes, generally cylindrical, passing through a steel plate (5), to which it is brazed, and said steel plate (5) constituting one of the walls of a distribution chamber (6) between said swirling gas tuyeres, supplied with said gas through a duct (7), said chamber (6) being fixed by means of said plate (5) to the exterior surface of the sheathing (8) of said converter.

4,413,816

GAS-BLAST PIPE FOR FEEDING REACTION AGENTS INTO METALLURGICAL MELTS

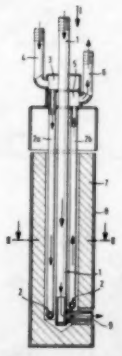
Simo A. I. Mäkipirtti, Nakkila; Mauri J. Peuralinna, Harjavalta; Valto J. Mäkitalo, Pori; Launo L. Lilja, Pori, and Helge J. Krogerus, Pori, all of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Jul. 22, 1981, Ser. No. 286,039

Claims priority, application France, Aug. 4, 1980, 80 2438

Int. Cl.³ C21B 7/16

U.S. Cl. 266—270 5 Claims



1. A device for blowing a gas continuously into a metallurgical melt, comprising: a blast pipe which has at one end an inlet

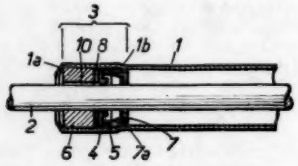
adapted to be connected to a source for the gas and at the opposite end an outlet adapted to be immersed below the melt surface in order to blow the gas into the melt; a cooling device attached to and surrounding the blast pipe, the cooling device comprising substantially smaller-diameter cooling pipes parallel to the blast pipe, the cooling pipes having inlets and outlets being adapted to be connected to a source of a gas-liquid mixture which vaporizes rapidly in the cooling device said inlets and outlets being at that end which is near the blast-pipe inlet; a thermally insulating mantle of ceramic material attached to and surrounding at least the lower part of the cooling device said mantle being further surrounded by a sleeve of graphite or silicon carbide or both, which sleeve is at least so thick that it protects the ceramic material from thermal shock when the device is lowered into the melt, so that the ceramic material reaches the temperature of the melt more slowly than the sleeve does and sinters before the sleeve wears out; and attached to the outlet of the blast pipe a Laval nozzle which is at an angle to the blast pipe and extends through the mantle and its sleeve.

4,413,817

PLUG DEVICE FOR THE PENETRATION OF A PLUNGER ROD INTO A CYLINDER OF GAS SPRING OF THE LIKE

Rene Bich, Maisons-Laffitte, France, assignor to Societe J. G. Allinquant, Gentilly, France

Filed Jan. 17, 1980, Ser. No. 113,036
Claims priority, application France, Jan. 17, 1979, 79 01107
Int. Cl.³ F16F 9/36
U.S. Cl. 267—64.11 **4 Claims**



1. Pneumatic spring apparatus having a cylinder, a trio plug device forming a closure at an end of said cylinder, and a reciprocable plunger rod slidably fitted through said plug device for operation in said cylinder, said trio plug device consisting of three elements in axial succession: a first annular holder member located at the outer side of said trio plug device including means of such design as to be rigid enough for mechanical guidance of said plunger rod in its reciprocation while being yieldable enough for allowing a degree of swivelling upon exertion of radial stresses on said rod, an intermediate annular gastight seal of resilient material having a central axially extending lip surrounding said rod and in direct sliding frictional engagement therewith, and a second annular holder member located at the inner side of said trio plug device including further means for oil retention to lubricate said seal lip, said seal being tightly sandwiched between said first and second holder members.

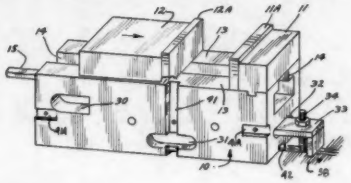
4,413,818

COMBINATION VISE

John O. Lenz, Coon Rapids, Minn., assignor to Kurt Manufacturing Company, Inc., Minneapolis, Minn.

Filed Aug. 24, 1981, Ser. No. 295,732
Int. Cl.³ B23Q 1/04
U.S. Cl. 269—81 **3 Claims**

1. A vise body having a pair of sidewalls, a pair of end walls joining said sidewalls, and a bottom wall joining the end and sidewalls, the exterior surface of the bottom wall forming a first plane support of the vise body on a table, guide means on said vise body on an upper side thereof opposite the bottom walls, a fixed jaw mounted on the upper wall adjacent said guideway, a movable jaw mounted on said guideway for movement toward and away from said fixed jaw, said fixed and movable jaws having longitudinal jaw axes extending transverse to the direction of movement of the movable jaw and generally parallel to the first plane, the side and bottom walls having generally flat exterior surfaces, the sidewalls defining plane at right angles to the bottom wall and parallel to each other, the fixed and movable jaws being of size to be entirely between the planes of the sidewalls, each of said sidewalls, end



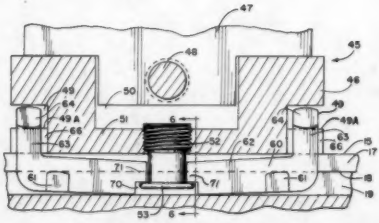
walls and bottom walls having groove means defined therein opening to the respective walls, and the groove means defining surfaces at right angles to the plane of the respective wall in which the respective groove means is formed to permit selectively placing the sidewalls and bottom wall onto a support table using the groove means surfaces for clamping, to thereby permit the vise body to be placed on a support table supported on either of said sidewalls with the longitudinal axes of said jaws extending perpendicular to such table, or supported on the bottom wall with the longitudinal axes of said jaws extending parallel to the table.

4,413,819

VISE CLAMP AND SWIVEL BASE VISE USING SUCH CLAMP

John O. Lenz, Coon Rapids, Minn., assignor to Kurt Manufacturing Company, Inc., Minneapolis, Minn.

Filed Apr. 9, 1981, Ser. No. 252,286
Int. Cl.³ B23Q 3/02
U.S. Cl. 269—99 **3 Claims**



1. A combination vise body and clamp comprising a vise body having a base defining a support plane and having clamping slot portions defined therein by surfaces generally parallel to the supporting plane adjacent opposite sides of the base for use in clamping the vise body onto a tool table having a T-slot defined therein, a screw member threadably mounted in the base of the vise body which extends into a T-slot of a table with which the vise and clamp assembly is to be used when the vise is supported along the supporting plane, and at least one clamp adapted to be positioned in a T-slot of such a table and operatively coupled to the vise body, said clamp comprising an elongated clamp body, said clamp body having a narrow transverse dimension of size to pass through such T-slot, a pair of laterally extending pivot members on each side of said clamp

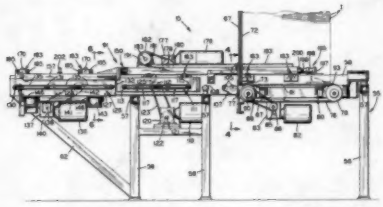
body establishing a pivot axis generally normal to the longitudinal axis of the clamp body, a head mounted at one end of said clamp body and when the clamp is positioned in such T-slot extending in direction outwardly from such table, said head having a shank and at least one protrusion extending outwardly from the shank to provide a surface that faces toward such table and which engages a surface defining one clamp slot portion of the vise base, the pivot members of the clamp being retained in the T-slot and with the head extending into one clamp slot portion on the vise base, and said clamp having means at the opposite end of the clamp body from the head engaged by said screw in the vise base, whereby said screw can be operated to lift the opposite end to thereby clamp the head onto a surface that defines a corresponding clamp slot portion.

4,413,820

SHEET HANDLING APPARATUS AND METHOD

James A. Meeker, and Christopher J. Jackson, both of Toledo, Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Nov. 2, 1981, Ser. No. 317,315
Int. Cl.³ B65H *5/02*
U.S. Cl. 271—101 **12 Claims**



1. An apparatus for providing fragile sheet articles with interleaves comprising: a frame, means mounted on said frame for supporting a vertical stack of interleaves thereon, means for stripping the lowermost interleave from said stack and advancing said interleave longitudinally in a first horizontal path toward a forward location, a horizontally reciprocal shuttle having gripping means above said horizontal path, means at said location for raising said interleave from said first horizontal path into engagement with said gripping means, and means moving said shuttle longitudinally in a second horizontal path above said first horizontal path to position said interleave in vertical registry above the sheet article for subsequent deposit thereon.

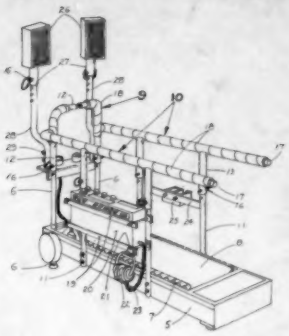
4,413,821

TREADMILL EXERCISER

Rocco Centafanti, 27 India St., Portland, Me. 04101

Filed Jul. 1, 1981, Ser. No. 279,320
Int. Cl.³ A63B *23/06*
U.S. Cl. 272—69 **4 Claims**

1. A treadmill for use with accompanying dance or marching music, said treadmill including a base, an endless support for a person carried by said base and extending lengthwise thereof and movable by the feet of such a person, framework, and means connecting said framework to said base, said framework including a front, transverse section and side sections connected thereto and extending substantially the full length of said base, each section including a metal core and a resiliently yieldable encasement therefor providing for the full length thereof, a hand grip of substantial cross sectional area wherever grasped by said person as his positions change in response to the tempo and type of the music and a cushion if otherwise engaged, said connecting means including vertical posts secured to the base and depending tubular members attached to the framework and dimensioned slidably to receive within them the upper end of the appropriate post, and means detachably connecting each member to the received post in a selected



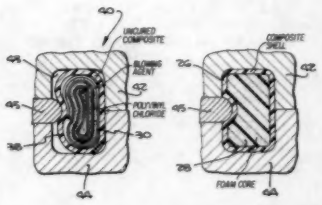
one of a plurality of vertically spaced positions relative to said support as required by the using person.

4,413,822

ELASTIC CORE COMPOSITE STRUCTURE AND METHOD OF MAKING SAME

David Fernandez, and Helena J. Fernandez, both of Camarillo, Calif., assignors to American Sports Equipment, Camarillo, Calif.

Filed Jul. 31, 1981, Ser. No. 288,999
Int. Cl.³ A63B *49/10*
U.S. Cl. 273—73 C **9 Claims**



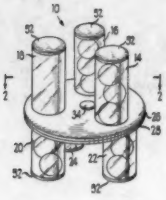
6. In a method for producing a composite tubular frame structure comprising a rigid outer shell and a core wherein a core precursor is surrounded by an uncured composite shell and placed in a mold whereupon heating of said mold, said core precursor expands to provide internal pressure necessary to shape said composite shell by forcing said shell against said mold, said shell curing to form said rigid outer shell and said expanded core precursor forming said core, wherein the improvement comprises:

providing a core precursor made from a thin sheet of flexible polyvinyl chloride and a suitable blowing agent, wherein said core precursor is prepared by spirally wrapping one or more of said thin sheets of said polyvinyl chloride having said blowing agent on at least one surface thereof, said spirally wrapped sheets forming a multi-layered tubular core precursor having blowing agent dispersed between said layers.

4,413,823
BALL PUZZLE

Jeffrey D. Breslow, Highland Park, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Nov. 3, 1980, Ser. No. 203,331
Int. Cl.³ A63F 9/08
U.S. Cl. 273—153 S 14 Claims

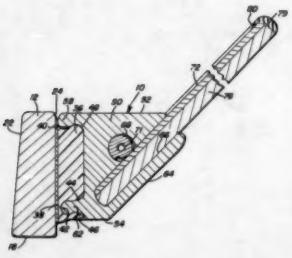


1. A puzzle comprising:
first and second base members rotatable coaxially relative to each other;
an equal number of apertures in said first and second base members;
an equal number of container means secured to said first and second base members, each said container means being in communication with one of said apertures;
a predetermined number of playing objects positionable in said container means, said objects being divided into a plurality of said objects, whereby a player can solve the puzzle by moving the objects to position each group in one of the container means; and
said apertures being defined in said first and second base members such that only one aperture in said first base member may be aligned with one aperture in said second base member at a time to allow one or more of said objects to move from one container means to another.

4,413,824
REFLECTIVE GOLF BALL PUTTER ALIGNMENT DEVICE

Merlson J. King, 393 Park Ave., and John E. Wood, Jr., 135 Columbia St., both of Corning, N.Y. 14830

Filed Oct. 16, 1981, Ser. No. 312,883
Int. Cl.³ A63B 69/36
U.S. Cl. 273—163 R 7 Claims

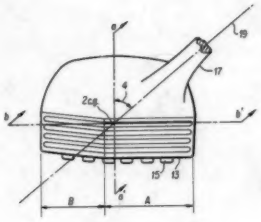


1. A golf ball putter alignment device comprising a reflective surface, means mounting the reflective surface from the rear face of a golf club putter head with the reflective surface extending upwardly and rearwardly therefrom in an inclined manner, said means comprising a bracket mount attached to the rear face of the putter head, a bracket attached to the bracket mount, said reflective surface being in the form of a mirror attached to the rear portion of the bracket thereby spacing the reflective surface from the rear surface of the putter head to increase the distance between the reflective surface and a golf ball positioned in front of the striking face of the putter head for the purpose of optimizing the accuracy and sight perspective of the putter alignment device, said bracket mount including a body having a pair of groove means formed thereon, said bracket including a body having a pair of rib means formed thereon for interlocking detachable, non-adjustable engagement with the groove means to enable assembly and disassembly of the bracket mount and bracket according to a fixed relationship wherein the vertical center lines of the bracket and mount are parallel.

4,413,825
GOLF CLUB

Howard A. Sasse, 27 Clyde Ave., Buffalo, N.Y. 14215

Continuation-in-part of Ser. No. 781,502, Mar. 25, 1977, abandoned. This application Aug. 24, 1978, Ser. No. 936,217
Int. Cl.³ A63B 53/04
U.S. Cl. 273—175 2 Claims



1. A wood-type golf club comprising a club head and a club shaft,
said club head and shaft joined so that the center line of the shaft, when extended, intercepts a vertical plane within the confines of the club head which is perpendicular to the base of the club head and passes through the center of gravity of said club head,
said club head having a striking face and a base portion, said striking face having a plurality of parallel corrugations thereon, ranging from 1/64 to ¼ inch in depth, said corrugations positioned parallel to said base, one of said corrugations positioned at the bottom of the striking face,
said striking face tapering outward from the top to the bottom of the face at an angle of from about 10° to about 15°,
said club having a toe and heel portion, 25 to 50 percent of the surface of said striking face positioned nearest the toe portion tapered inward toward the back of the club head, at an angle between about 6° and about 12° to form two separate, substantially planar ball-striking surfaces on said striking face,
the base portion of said club head consisting of a plurality of parallel runners thereon, said runners positioned parallel to the direction that the club would travel to strike a ball.

4,413,826
GOLF TRAINING AID

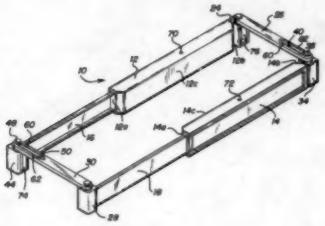
Gardner H. Miller, Albuquerque, N. Mex., assignor to Trustroke International, Inc., Albuquerque, N. Mex.

Filed Jul. 14, 1982, Ser. No. 398,112
Int. Cl.³ A63B 69/36
U.S. Cl. 273—186 C 5 Claims

1. A golf training aid comprising:
first and second elongated telescopically extendable rail means each having first and second ends and being extendable to an operational position or retracted to a storage position;
first elongated adjustable slide rail means having first and

second ends, said first end thereof being pivotally connected to said first end of said first elongated telescopically extendable rail means, said second end thereof being selectively pivotally connected to said first end of said second elongated telescopically extendable rail means in said operational position to thereby rigidly couple said first ends of said first and second elongated telescopically extendable rail means in said operational position;

second elongated adjustable slide rail means having first and second ends, said first end thereof being pivotally connected to said second end of said first elongated telescopically extendable rail means, said second end thereof being selectively pivotally connected to said second end of said second elongated telescopically extendable rail means in said operational position to thereby rigidly couple said second ends of said first and second elongated telescopically extendable rail means in said operational position;



said first and second elongated adjustable slide rail means being disposed substantially perpendicular to said first and second elongated telescopically extendable rail means to thereby maintain said first and second elongated telescopically extendable rail means in a preselected spaced apart relationship throughout the entire length of said first and second elongated telescopically extendable rail means in said operational position;

said first and second elongated adjustable slide rail means being disposed transversely to said first and second elongated telescopically extendable rail means in said storage position such that said first and second elongated telescopically extendable rail means contact each other to enable the golf training aid to collapse to a compact configuration; and

means for rigidly locking together said elongated telescopically extendable rail means and said elongated adjustable slide rail means in said operational position and said storage position.

4,413,827

SCALED-DOWN GOLF COURSE GAME

Erik O. Aberg, Pensacola, Fla.

Continuation of Ser. No. 955,218, Oct. 27, 1978, abandoned, which is a continuation-in-part of Ser. No. 947,572, Oct. 2, 1978, abandoned, which is a continuation of Ser. No. 869,161, Jan. 13, 1978, abandoned. This application Jul. 29, 1980, Ser. No. 173,366

Int. Cl.³ A63B *69/36*

U.S. Cl. 273—176 AB **5 Claims**

1. A scaled-down golf game designed to be played with normal golf clubs, comprising:

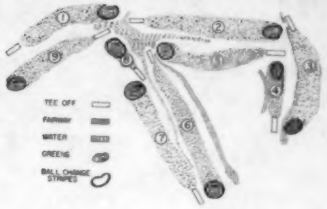
a plurality of golf holes having various par values,

each hole including a first area designated as a driving tee, a second area provided as a putting surface and a fairway area located between the first and second areas,

two types of balls, of normal golf ball size, one being a fairway ball which is designed to resist long flight when struck by a golf club and the other being a putting ball which is designed to have normal golf ball characteristics when chipped and putted, the driving characteristics of said balls being such that the fairway ball can be driven about one-fourth the distance the putting ball can be driven with the same stroking force,

the fairway area for each hole having a length which is scaled-down relative to the length of a fairway of a corresponding hole of a normal sized golf course by a factor which is the ratio of the distance the fairway ball can be driven relative to the distance said putting golf ball can be driven,

whereby each of the holes of the scaled-down golf game has



a par value equal to the par value of the corresponding hole of the normal sized golf course, and

an indication means provided at a designated distance from the periphery of the putting surface for indicating when the putting ball is to be substituted for the fairway ball, the indication means comprising a stripe located a designated distance from the periphery of the putting surface,

whereby chipping may be performed using the putting ball designed to have normal golf ball characteristics when chipped.

4,413,828

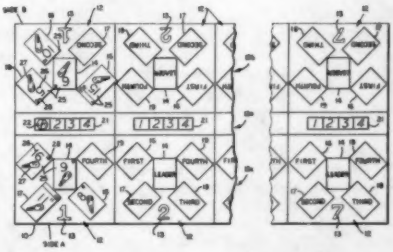
METHOD OF PLAYING A BOARD GAME UTILIZING CARDS

Anthony R. Gardner, 436 No. Highland Ave., NE, Atlanta, Ga. 30307

Division of Ser. No. 178,138, Aug. 14, 1980, Pat. No. 4,362,302. This application Mar. 25, 1982, Ser. No. 361,500

Int. Cl.³ A63F *3/00*

U.S. Cl. 273—236 **9 Claims**



1. A method of playing a card game comprising the steps of:

dealing a plurality of cards each bearing an indicium thereon to each of two opposing posts so as to designate a leader card and one or more cards in one or more of each of a plurality of supporting positions;

conducting a first contest by comparing the leader card and any cards present in a first supporting position of one of said posts with the leader card and any cards present in a first supporting position of the other of said posts to determine a winning post and a losing post for said first contest;

removing from said losing post said leader card and cards present in said first supporting position;

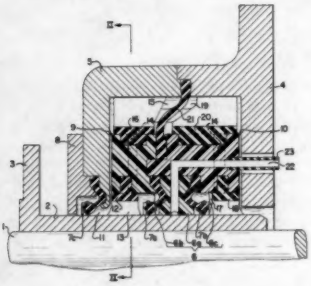
selecting a new leader card for said losing posts;
conducting a second contest by comparing the leader cards and cards present in a second supporting position of said two posts to determine a winning post and a losing post for said second contest; and
removing from said losing post said leader card and cards present in said second supporting position.

4,413,829

SHAFT SEALING ASSEMBLY

Günter Pietsch, Hamburg, Fed. Rep. of Germany, assignor to Howaldtswerke-Deutsche Werft Aktiengesellschaft Hamburg und Kiel, Hamburg, Fed. Rep. of Germany

Filed Feb. 18, 1982, Ser. No. 350,022
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1981, 3106318
Int. Cl.³ F16C 33/74; F16J 15/40
U.S. Cl. 277—3 8 Claims



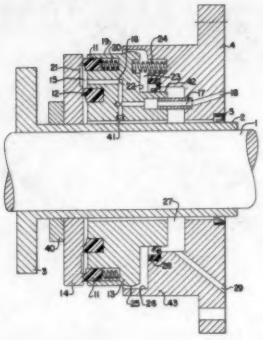
1. A shaft sealing assembly for sealing a shaft extension emerging from a housing which is at least partly cylindrical, the assembly comprising: at least one lip type sealing element disposed within said housing for making a seal on the shaft extension to be sealed, said sealing element being fastened to and supported by a mounting ring means of composite construction, said mounting ring means being disposed substantially coaxially with the shaft, said mounting ring means in turn being nonrotatably supported within said housing by an annular shaped resilient wall member, said annular shaped wall member being fastened along its outer periphery to an inside surface of said housing, whereby, by the flexing action of said wall member, said mounting ring in use is capable of radial displacements so as to accommodate any shaft-eccentricity and vibratory radial displacements of said shaft extension, wherein said mounting includes a plurality of ring elements fastened together and supporting two of said sealing elements which are axially spaced from each other and disposed on said shaft extension, the shaft assembly including: an additional lip type sealing element adapted to be disposed on said shaft extension and supported by an end portion of said housing, said assembly including a first annular shaped reservoir chamber defined partly by a surface of the shaft extension and partly by said at least one sealing element and said additional sealing element and partly by an inner surface of the mounting ring, said reservoir chamber adapted to contain a liquid lubricant; an outer annular chamber disposed radially outside of and substantially coaxial with said first annular chamber, the assembly including a first liquid passage in the form of a conduit interconnecting said first and outer annular chambers, the shaft sealing assembly including a first stationary deflector means supported by said mounting ring to extend towards the shaft, said deflector means being so shaped as to cause a whirl of said liquid lubricant and force the lubricant from said first annular shaped reservoir chamber to said outer annular chamber via said first liquid passage.

4,413,830

SEAL ASSEMBLY FOR ROTATING SHAFTS

Günter Pietsch, Hamburg, Fed. Rep. of Germany, assignor to Howaldtswerke-Deutsche Werft Aktiengesellschaft Hamburg und Kiel, Kiel, Fed. Rep. of Germany

Filed Dec. 2, 1981, Ser. No. 326,812
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1980, 3045855
Int. Cl.³ F16J 15/34
U.S. Cl. 277—27 10 Claims



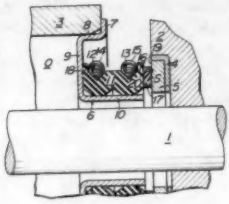
1. A seal assembly for rotating shafts, for use as a sea-water seal of an aft stern tube seal for ships,
said assembly comprising two slide rings, namely, a first outer slide ring and a second inner slide ring radially spaced and concentrically arranged in substantially one plane;
a receiving ring which surrounds the rotatable shaft and is axially movable, and in which said slide rings are mounted on one side,
the rear side of said receiving ring being partially exposed to the surrounding sea-water;
a counter-ring against which the slide rings are pressed,
said slide rings, receiving ring and counter-ring forming a closed annular space for containing a pressurized liquid medium for lubricating said slide rings;
the first, outer slide ring sealing the annular space against the surrounding sea-water, said outer slide ring being flexibly supported in the receiving ring and comprising a hydrostatic seal;
a gap for lubrication which is influenced by the pressure of the liquid medium in said annular space; and
the second, inner slide ring sealing said annular space against a drained void space at an inboard end of the sea-water seal,
in operation said inner slide ring being made as a hydrodynamic seal and urged into contact with the counter-ring by the pressure of the sea-water which is acting against the rear side of the receiving ring,
said outer slide ring being provided with a chamfered circumferential edge formed on its inner surface such that the chamfer is in contact with said annular space and also said counter-ring,
whereby, said pressurized fluid in said annular space causes a slight opening of said chamfered circumferential edge so as to allow a slow escape of pressurized fluid from said annular space to the surrounding sea-water.

4,413,831

FACE SEAL WITH ELASTOMERIC AXIAL THRUST MEMBER

Akira Washida, Tateishi, and Yuji Nakauchi, Sakura, both of Japan, assignors to Kabushiki Kaisha Arai Seisakusho, Tokyo, Japan

Filed Jan. 6, 1983, Ser. No. 455,907
Claims priority, application Japan, Jan. 9, 1982, 57-1960
Int. Cl.³ F16J *15/38*
U.S. Cl. 277—40 **4 Claims**



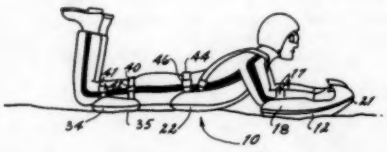
1. A shaft seal device essentially comprising:
a rotary ring fluidtightly fitted onto a rotating member;
a stationary ring fluidtightly fitted into a stationary member;
a cylindrical seal ring member made of elastomeric material, said seal ring member being mounted around an inner sleeve portion of said stationary ring and having at least two annular grooves formed on the outer surface thereof, one of both the end faces of the seal ring member being brought into contact with the corresponding end face of the rotary ring, while the other one end face being brought into contact with a wall portion of the stationary ring; and
ring-shaped resilient means fitted into said annular grooves on the seal ring so as to elongate the seal ring in the axial direction under the influence of contractive force caused by means of said resillient means whereby both the end faces of the seal ring member are placed in tight contact against the corresponding faces of the rotary and stationary rings.

4,413,832

BODY SLED

James E. Pendleton, 5705 SW 187th Pl., Aloha, Oreg. 97007

Filed Nov. 19, 1981, Ser. No. 322,743
Int. Cl.³ B62B *13/02*
U.S. Cl. 280—12 R **10 Claims**



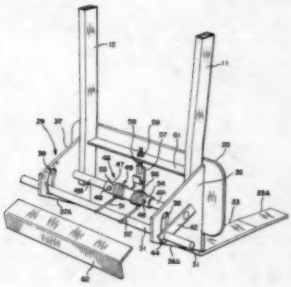
1. A body sled mountable to the forearms, chest and thighs of a rider's body, comprising:
a pair of individual, unconnected forearm control runners, one for each forearm of the rider;
means on each of the forearm control runners for releasably securing the forearm control runners respectively to the forearms of the rider;
a chest plate separate and disconnected from the forearm control runners;
means on the chest plate for releasably attaching the chest plate to the chest of the rider independently of the forearm control runners;
a pair of thigh runners separate and disconnected from one another and from the forearm control runners; and
means on each of the thigh runners for releasably securing the thigh runners respectively to the thighs of the rider for independent movement with the rider's thighs in relation to the chest plate and forearm control runners;
wherein the forearm control runners, chest plate, and thigh runners are positioned by the respective means on the rider's body to slide individually and independently over a surface such as snow or ice with the rider lying substantially in a prone position.

4,413,833

TWO-WHEEL HAND TRUCK

Wayne R. Tucker, P.O. Box 512, Volga, S. Dak. 57071

Filed Mar. 2, 1981, Ser. No. 239,525
Int. Cl.³ B62B *1/02*
U.S. Cl. 280—47.22 **31 Claims**



1. A hand truck comprising: a frame movable between a generally upright loading position and a rearwardly inclined transport position, said frame having side members, each side member having an upper end and a lower end, cross members secured to the side members between the upper and lower ends thereof, handle means attached to the upper ends of the side members, plate means attached to the lower ends of the side members, support means attached to the plate means for holding at least one object adjacent said plate means, wheel means to movably support the truck on a surface, axle means rotatably supporting the wheel means, mount means connecting the axle means to the plate means, said mount means including support members secured to the plate means and projected rearwardly therefrom, said support members having upwardly directed slots, said axle means extended through said slots whereby the axle means has limited generally vertical oscillating movement, shaft means rotatably mounted on the support members and extended generally parallel to the axle means, arm means secured to the shaft means and axle means whereby movement of the axle means in the slots rotates the shaft means, and biasing means mounted on the shaft means and engageable with the axle means operable to bias the axle means in a downward direction and hold the frame in its generally upright loading position.

4,413,834

WOOD TOTER

Leonard C. Base, Rte. #3, Kingman, Kans. 67068

Division of Ser. No. 151,174, May 19, 1980, Pat. No. 4,343,483.
This application Nov. 30, 1981, Ser. No. 325,739
Int. Cl.³ B62B *1/02*
U.S. Cl. 280—47.26 **1 Claim**

1. A wheeled carrier for hauling logs or the like comprising:
an elongated arcuate panel including a pair of open ends having sides essentially symmetrically tapering from a generally central apex position towards the ends;

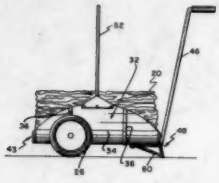
an axis secured to said panel and having a structure defining an arcuate groove contouring the bottom of said panel wherein said panel lodges;

a pair of wheels supported by said axis and rotatably carried thereby, and

a handle bar connecting to and extending upwardly from said panel to facilitate the operation of the carrier when the same is gripped by a user, said axis is secured to said panel between said central position and one of the ends;

a log retention member transversing said panel from the generally central position of both sides;

said retention member comprises a rod configurated to a U-shape and having its ends secured to the apices of both sides to retard the buckling of the sides when a large number of logs are loaded in the carrier;



a prop means secured to the bottom of said panel in proximity to the opposite end of said panel from where said axis is proximately secured;

said handle bar is secured on the bottom and at the opposite end of said panel from where said axis is proximately secured, said prop means being secured to said handle bar;

said carrier in operation having said handle bar gripped to lift said prop means off the ground in order to roll the wheels of said carrier to haul logs;

at least one band member traversing the outside of said panel and secured thereto to strengthen said panel and prevent the sides of same from buckling;

said panel and said axis each include a structure defining a plurality of apertures for receiving a fastening means to secure the panel to the axis.

4,413,835

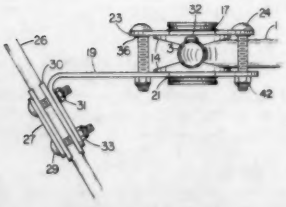
HITCH FOR ONE-WHEEL CYCLE TRAILERS

Richard Hazelett, P.O. Box 60, Colchester, Vt. 05446

Filed Feb. 11, 1981, Ser. No. 233,681

Int. Cl.³ B62D *63/08*

U.S. Cl. 280—204 **2 Claims**



1. For use in conjunction with a one-wheel trailer having a normal upright position and adapted to be pulled by the frame of a "cycle," such as a bicycle, motorcycle or moped, universal-joint hitch apparatus comprising:

a trailer frame for said one-wheel trailer having a transverse elongated frame member with a cylindrical rounded surface,

said elongated frame member extending horizontally transverse to the length of said one-wheel trailer when said trailer is in said normal upright position,

mounting means including attachment means for attaching said mounting means to the frame of the cycle for pulling the one-wheel trailer,

upper and lower wafer-like annular sector bearing elements positioned one above the other in spaced parallel relationship,

each of said sector bearing elements having a cylindrical concave bearing surface extending transversely horizontally across the respective element,

said upper sector bearing element being positioned above said elongated frame member with the concave bearing surface thereof engaged down against the cylindrical rounded surface of said elongated frame member,

said lower sector bearing element being positioned below said elongated frame member with the concave bearing surface thereof engaged up against the cylindrical rounded surface of said elongated frame member with said elongated frame member being journaled between the respective concave bearing surfaces of said upper and lower sector bearing elements for providing a transverse pivot axis,

said upper sector bearing element having an upwardly projecting centrally located trunnion with an upwardly facing thrust surface encircling said trunnion,

said lower sector bearing element having a downwardly projecting centrally located trunnion with a downwardly facing thrust surface encircling said latter trunnion,

said two trunnions being aligned for defining a vertical pivot axis,

said mounting means having a hole for receiving one of said trunnions and having a surface complementary with the thrust surface which encircles said one trunnion for engaging against said thrust surface,

a cap plate having a hole for receiving the other of said trunnions,

said cap plate having a surface complementary with the thrust surface which encircles said other trunnion for engaging against said latter thrust surface, and

clamping means urging said cap plate and said mounting means toward each other.

4,413,836

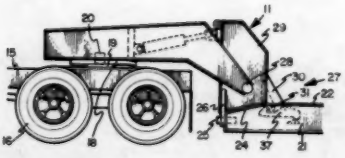
TRACTOR-TRAILER COUPLING MEANS

Russell L. Losh, Rensselaer, Ind., assignor to Talbert Manufacturing, Inc., Rensselaer, Ind.

Filed Jul. 31, 1981, Ser. No. 288,896

Int. Cl.³ B62D *53/06*

U.S. Cl. 280—423 B **6 Claims**



4. A coupling assembly for connecting a tractor to a low-bed trailer, comprising:

a gooseneck on said tractor projecting rearwardly therefrom and mounted thereon for vertical and lateral movements;

a tail member attached to the rearward portion of said gooseneck, said tail member having secured thereto a bar;

guide means secured to the front of said low-bed trailer for receiving said tail member, said guide means extending upwardly from the floor of said trailer, and said guide means including converging side walls secured to said trailer;

a latching bin situated at the uppermost portion of said trailer, laid bin having restriction walls coextensive with said converging side walls, and a back wall secured therebetween, and said bin having an aperture in the base thereof; and

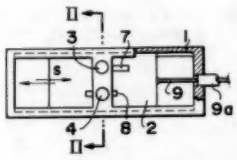
hook means pivotally attached to said trailer and proximate said aperture, said hook means having a locking surface, means associated with an activating said hook, and means to urge said locking surface of said hook means upwardly to engage said bar of said tail member.

4,413,837

DEVICE FOR ADJUSTING THE HEIGHT OF VEHICLES

Yasuyuki Hayashi, Fukuroi, Japan, assignor to Showa Manufacturing Co., Ltd., Tokyo, Japan

Filed Mar. 4, 1981, Ser. No. 240,455
Claims priority, application Japan, Jul. 24, 1980, 55-100481
Int. Cl.³ B60G *11/26*
U.S. Cl. 280—707 **5 Claims**



1. A device for adjusting the height of a vehicle, comprising:

a slidable pattern plate;

at least one each of a polarity-determination and allowable-displacement pattern on said slidable pattern plate, said pattern and pattern plate including through slots;

at least one each of a polarity-determination and allowable-displacement pattern on said slidable pattern plate;

means movable relative to said pattern plate in parallel relation in response to a change in the vehicle height for detecting said polarity-determination pattern in confronting relation;

means movable relative to said pattern plate in parallel relation in response to a change in the vehicle height for detecting said allowable-displacement pattern in confronting relation, said polarity-determination pattern having one end thereof normally positioned in confronting relation to said polarity-determination pattern detecting means and extending in a direction of movement of the pattern, and said allowable-displacement pattern having a center thereof normally positioned in confronting relation to said allowable-displacement pattern detecting means and extending in a direction of movement of the pattern; and

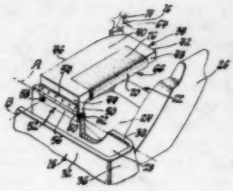
an electrical circuit for producing a signal indicative of an increase or reduction in the vehicle height depending on whether or not said polarity-determination pattern detecting means produces an output signal when said allowable-displacement pattern detecting means produces no output signal.

4,413,838

PASSENGER RESTRAINT SYSTEM

John H. Varterasian, Livonia, Mich.; Albert R. Plack, Middleburg Heights, Ohio, and Jackson W. Melichar, Sterling Heights, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 13, 1981, Ser. No. 321,115
Int. Cl.³ B60R *21/10*
U.S. Cl. 280—751 **3 Claims**



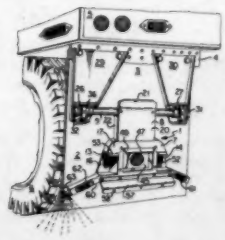
1. In combination with a vehicle having a front passenger seat comprising a seat cushion and a seat-back, said vehicle having a console along one side of said passenger seat; a passenger restraint table normally stored in a vertical position and adapted to be moved to a horizontal position above said seat cushion forwardly of said seat-back and extend across the torso of a passenger, said table in said horizontal position having a substantial dimension longitudinally of the vehicle; means connecting one end of said passenger restraint table to said console and permitting said passenger restraint table to be initially pivoted upwardly from said console about a first axis which extends transversely to the longitudinal axis of the vehicle followed by pivotal movement about a second axis which is substantially perpendicular to said first axis so as to allow said passenger restraint table to be moved from said vertical position to said horizontal position, a snubber secured to said vehicle for limiting forward movement of the other end of said passenger restraint table when said passenger restraint table is located in said horizontal position; and energy-absorbing means incorporated within said passenger restraint table and having substantial extent and absorbing capability in the longitudinal direction of the vehicle; said means and said snubber cooperating to maintain said passenger restraint table in a fixed position so as to cause said energy-absorbing means to cushion forward movement of said passenger in said front passenger seat when the torso of said passenger impacts against said passenger restraint table during sudden deceleration of said vehicle.

4,413,839

MUD FLAP STABILIZER DEVICE

Thomas S. McCain, 9325 Georgia, Kansas City, Kans. 66109

Filed Sep. 14, 1981, Ser. No. 301,477
Int. Cl.³ B62D *25/16*
U.S. Cl. 280—154.5 R **4 Claims**



1. A mud flap stabilizer device for use with an elongate,

generally rectangular mud flap formed of flexible material, and being swingably supported adjacent its upper end from a vehicle body rearwardly of an in close proximity to a vehicle wheel mounted tire; said stabilizer device comprising:

(a) a stabilizer frame body;

(b) a hanger member extending upwardly from said frame body;

(c) a normally horizontally extending bar member having opposing ends, said hanger member secured to said bar member whereby said frame body depends therefrom;

(d) swing mounting means for connecting said bar member opposite ends to said vehicle body rearwardly of said mud flap to position said frame body thereagainst;

(e) rotation limiting means affixed to said bar member for controlling swinging movement of said frame body; and

(f) illumination means connected to said frame body for visual enhancement thereof;

(g) said frame body having spaced backing and front members providing an interior passage and closed by sidewalls;

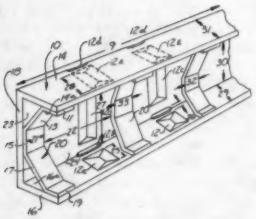
(h) said illumination means includes electrical lights having electrical wiring routed through said passage for protection of said wiring.

4,413,840

MECHANISM TO CONTROL AXIAL COLLAPSE OF AN OPEN CROSS-SECTION BEAM

Ramesh H. Shah, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 14, 1981, Ser. No. 301,791
Int. Cl.³ B62D *27/04*
U.S. Cl. 280—784 **14 Claims**



1. A method of controlling the axial collapse of an open cross-sectioned beam having flanges constituting angulated walls of the beam, comprising:

(a) attaching trusses at spaced intervals along said beam, said trusses extending laterally between angulated walls of

(b) forming depressions in said flanges located at least intermediate said trusses, said trusses and depressions each having an axial dimension which is about 1/6–½ the spacing between said trusses; and

(c) subjecting said beam to axial loading effective to collapse said flanges between said trusses, said flanges folding substantially only at said depressions.

4,413,841

SAFETY SEAT BELT ARRANGEMENT FOR AUTOMOTIVE SEAT OCCUPANT

Hideoki Matsuoka, Yokohama, and Yoshinobu Kondoh, Kosai, both of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Jun. 26, 1981, Ser. No. 277,802
Claims priority, application Japan, Jun. 27, 1980, 55-90974[U]
Int. Cl.³ B60R *21/10*
U.S. Cl. 280—802 **12 Claims**

1. A safety seat belt arrangement for an automotive vehicle, comprising:

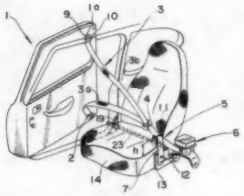
(a) a first belt, having one end supported so as to be brought in contact with a shoulder portion of a seat occupant and the other end supported so as to be brought in contact with the lap of the seat occupant;

(b) a second belt, having one end secured to a first pivot ring having a hole through which said first belt is inserted and the other end held by a belt retractor located at the inboard side of the seat;

(c) a projecting member engageable with a portion of the door and movable inwardly when the door is closed, and free to move outwardly when the door is open;

(d) an elastic means for biasing said projecting member so as to urge said projecting member toward the outboard side of the seat;

(e) an arm assembly rotatably supported on a frame member located on the inboard side of the seat, having a means for supporting said second belt at one end thereof and an axle at the other end thereof;



(f) a stop, positioned between said elastic means and projecting member and fixed to the inboard side of said projecting member;

(g) a wire for translating the movement of said stop to said engagement means, having one end fixed to said stop and the other end rotatably attached to said axle of said arm assembly;

(h) a pulley for guiding said wire between said stop and axle of said arm assembly, being positioned at the rear inboard corner of the seat; and

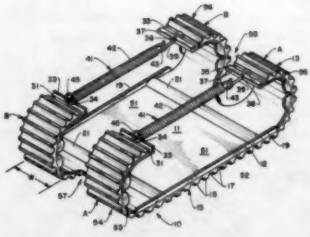
(i) a bracket attached to the rear of the seat for limiting the range of movement of said stop, the range of movement of said stop determining the range of rotation of said arm assembly, so that said second belt and, consequently, said first belt are moved away from the seat occupant, when said projecting member moves outwardly and the door is open.

4,413,842

WALKING ATTACHMENT FOR ROLLER SKATES

Isidoro Loredo, 570 N. Main St., Manteca, Calif. 95336

Filed Jun. 22, 1981, Ser. No. 276,089
Int. Cl.³ A63C *3/00*
U.S. Cl. 280—825 **4 Claims**



1. An attachment to convert roller skates for walking comprising

a sole plate having a top and bottom surface, said sole plate

having a rearward facing forward arcuate section connected to a central generally planar section in turn connected to a forward facing rear arcuate section sized in radius to correspond to the radius of the forward section,

each arcuate section comprising a pair of spaced slightly flexible arc portions,

at least the central section of said sole plate having an upstanding flange along each side thereof,

a traction tread secured to the bottom surface of said sole plate,

a pair of parallel forwardly and rearwardly adjustable wheel retainers mounted spaced from the arcuate sections and spaced from each, and adapted to prevent forward and rearward movement of skate trucks when said trucks are placed in the attachment,

means disposed in said central section for adjustably mounting said wheel retainers, and

releasable spring means for springingly connecting one arcuate section to the other arcuate section, mounted on the top of each such section.

4,413,843

MICROCAPSULES, METHOD FOR THEIR PRODUCTION AND PRESSURE SENSITIVE COPYING SHEET

Hiroshi Iwasaki, Kawanishi, and Shinsuke Irii, Nishinomiya, both of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

Filed Dec. 26, 1979, Ser. No. 107,066

Claims priority, application Japan, Dec. 29, 1978, 53-165311

Int. Cl.³ B01J *13/02;* **B32B** *27/42;* **B41L** *1/36*

U.S. Cl. 282—27.5 **8 Claims**

1. A method of making microcapsules comprising the steps of preparing an aminoaldehyde resin prepolymer of at least one amine and at least one aldehyde, and performing polycondensation of said aminoaldehyde resin prepolymer in an aqueous dispersion including particles of hydrophobic core material in the presence of anion-modified polyvinyl alcohol to form aminoaldehyde resin microcapsule walls around said particles of hydrophobic core material, said anion-modified polyvinyl alcohol being used in an amount between about 0.1 and about 20% by weight of the amount of said aqueous dispersion.

7. Microcapsules which are prepared by a method as claimed in claim 1.

8. Pressure sensitive copying sheet comprising a support having coated thereon a layer of microcapsules as claimed in claim 7.

4,413,844

SWIVEL CONNECTOR BETWEEN A FLOATING OR SEMI-SUBMERGED STRUCTURE AND A RISER OR FLOW LINE

Xuong N'Guyen Duc, Rueil Malmaison, and Rene Szabo, Le Pecq, both of France, assignors to Coflexip, Rueil Malmaison, France

Filed Feb. 25, 1981, Ser. No. 238,120

Claims priority, application France, Feb. 29, 1980, 80 04623

Int. Cl.³ F16L *55/00*

U.S. Cl. 285—16 **7 Claims**

1. A swivel connection arrangement between a structure, floating or partly submerged in a body of water and a flow conduit for hydrocarbons comprising, a structure adapted to be supported in a body of water,

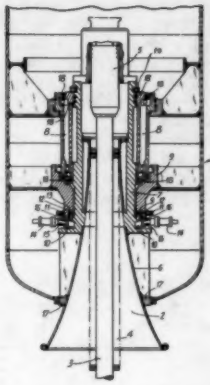
a connection element including means for fixing the conduit to said element;

bearing means supported on said structure,

support means on said connection element for supporting said connection element on said bearing means,

said bearing means supporting the connection element on the structure for rotation relative to the structure about an axis, whereby said connection element and the conduit connected thereto can normally rotate relative to said structure,

means for locking said connection element to said structure and moveable between



a first position in which said bearing means supports said connection element for rotation thereof relative to the structure, and

a second position in which said connecting element is locked to and supported by said structure independently of said bearing means.

4,413,845

PIPE COUPLINGS

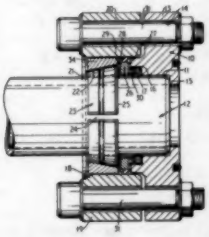
Anthony J. Lawrence, Teddington, England, assignor to Tungum Hydraulics Limited, Cheltenham, England

Filed Oct. 20, 1980, Ser. No. 199,016

Claims priority, application United Kingdom, Oct. 18, 1979, 7936130

Int. Cl.³ F16L *55/00*

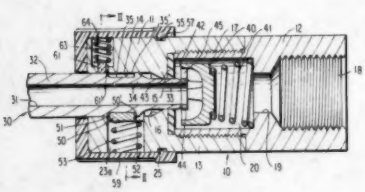
U.S. Cl. 285—23 **5 Claims**



1. A pipe coupling comprising a first pipe-encircling member having a bore therein adapted to receive the pipe and having an outwardly extending projection, a recess coaxial with said bore and a sealing element disposed within the recess and of said first member to provide a seal between the member and a pipe, a second pipe-encircling member having an internal bore provided with an internal shoulder and an outwardly extending projection, a pipe-gripping collar within the bore in the second member and having an external frusto-conical surface so arranged that, upon axial movement of the second member towards the first member, the collar is contracted radially to grip the pipe, adjustable clamping means engageable with said projections on the first and second members to move the second member axially towards the first member without relative

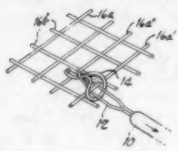
rotation between the members, a slip ring located within the bore of the second member against the internal shoulder of said second member and having an internal frusto-conical surface which coacts with the external frusto-conical surface of the collar, a washer having one side in surface-to-surface engagement with an end surface of the collar and the other side in surface-to-surface engagement with the first pipe-encircling member, the washer having a metal body, a body of rubber encapsulating the metal body of the washer, a peripheral rubber flange integral with said encapsulating body of rubber for engagement with the bore in said second member to retain the collar and the slip ring within the bore of the second member, and a resilient rubber backing ring integral with said encapsulating body of rubber which extends into and cooperates, in use, with said recess and the sealing element to prevent extrusion of the material of the sealing element under high pressure conditions.

4,413,846
HOSE COUPLING
Hans Oetiker, Oberdorfstrasse 21, Horgen, 810
Filed Apr. 24, 1981, Ser. No. 257,321
Int. Cl.[3] F16L *39/00, 37/00*
U.S. Cl. 285—317 **20 Claims**



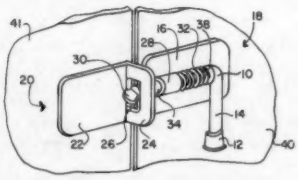
1. A locking arrangement for a coupling in which a male coupling member provided with an external annular groove is adapted to be inserted into a bore of a female coupling member whose bore is in direct communication with the outer surface of the female coupling member by way of a cutout whose imaginary chord-like inner end intersects said bore, and which includes latching means for holding the male coupling member in its connected position relative to the female member, when said cutout is in substantial axial alignment with said external annular groove by extending through said cutout into engagement with the shoulder surface formed by said annular groove, and actuating means on said female coupling member operable to engage with said latching means for withdrawing said latching means from said external annular groove to enable disengagement of said male coupling member from said female coupling member, characterized in that a safety locking means is provided in the female coupling member which prevents complete disengagement of the male coupling member from said female coupling member upon actuation of said actuating means until substantial decrease of pressure in a line connected to the female coupling member, said safety locking means including a locking member inserted into a slot provided in said female coupling member behind said cutout in the disengaging direction of said male member, said slot intersecting said bore, a spring in said female coupling member normally urging said safety locking member into its locking position, and further means operatively connecting said actuating means with said locking member in such a manner that said locking manner is normally held out of intersecting said bore but upon actuation of said actuating means is released before complete release of said male coupling member by said latching means so that said male coupling member is pressed with its shoulder surface against said locking member by pressure existing in a line connected to said female coupling member to enable a decrease of said pressure.

4,413,847
HOOKING TOOL FOR HOBBY USERS
John S. Doyel, 404 W. 20th St., New York, N.Y. 10011
Filed Mar. 16, 1981, Ser. No. 244,287
Int. Cl.[3] B65H *69/04*
U.S. Cl. 289—17 **13 Claims**



1. A rug hooking tool having a handle and a closed, integral loop of firm material which extends forwardly from the handle and comprises a greater width portion which smoothly narrows forwardly to a lesser width tip, said loop being dimensioned to be inserted forwardly into canvas meshes between warp and weft runs such that a warp or weft run is over the loop and such that the tip and at least a part of the greater width portion of the loop are forwardly of said run while at least a major portion of the handle is rearwardly of the run, whereby when the loop is so inserted in the canvas, and there is a length of yarn with a central part thereof just rearwardly of the run and between the tool and the canvas and the free ends thereof extending away from the tool and/or canvas, said yarn length can be knotted to said run by pushing the free ends thereof forwardly over said run and downwardly into the loop and withdrawing the tool from the canvas by moving it rearwardly of said run, said loop being dimensioned in width to receive freely said free ends of the yarn length and said tip being dimensioned in width to receive said free ends relatively tightly in the course of said rearward movement of the tool.

4,413,848
LATCHING MECHANISM FOR PANELS
John Y. Leaver, Elkhart, Ind., and Harold D. Huggins, Quincy, Ill., assignors to The Knapheide Mfg. Co., Quincy, Ill.
Filed Jan. 9, 1981, Ser. No. 223,626
Int. Cl.[3] E05C *5/02*
U.S. Cl. 292—59 **1 Claim**



1. In a latching device for attaching a first and a second member together comprising a rotatable latch rod slidably attached to said first member, said latch rod having an engaging end; and receiving means for engaging said engaging end attached to said second member, the improvement comprising:

said latch rod being spring biased away from said receiving means, said engaging end having an edge defining a cam surface such that when said latch rod is engaging said receiving means and when said latch rod is rotated, said latch rod moves in a direction along its longitudinal axis;

said device further comprising a plate attached to said first member and a hollow cylinder attached to said plate, said latch rod being received within said hollow cylinder and wherein said latch rod is L-shaped having a first and a

second leg, said first leg passing through said hollow cylinder, and said second leg comprising a handle;

said device further comprising a ring fixedly attached to said first leg and a spring circumferentially surrounding a portion of said first leg and being located between said hollow cylinder and said ring, and wherein said receiving means has a slot therein which receives said engaging end and is an L-shaped plate having a first and a second flange, said first flange being attached to said second member, and said slot being located in said second flange;

said device further comprising an insert for attaching to said receiving means, said insert comprising a flat member having a tongue and a head, said tongue having a width less than the width of said slot such that said tongue fits within said slot, and is attached to said first flange, said head having a second slot to receive said engaging end.

4,413,849

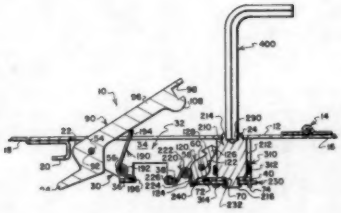
TOOL-OPERATED FLUSH-MOUNTABLE LATCH

Edwin W. Davis, Medina, and Jack A. Braun, Cleveland, both of Ohio, assignors to The Eastern Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 124,749, Feb. 26, 1980, abandoned. This application Dec. 15, 1980, Ser. No. 215,567

Int. Cl.³ E05C *3/04*

U.S. Cl. 292—229 **16 Claims**



1. A flush-mountable, tool-operable latch suitable for mounting on a door panel or the like to releasably retain the door panel in a closed position, comprising:

(a) a body having wall portions which define an elongate, forwardly-facing recess, and having mounting formation means on opposite sides of the recess for mounting the body on a door panel with the forwardly-facing recess aligned with an elongate opening formed through the door panel;

(b) an elongate latch lever pivotally connected to the body and having:

(i) a strike-engaging formation which is movable between a latched position wherein it is engageable with a strike for retaining the door panel in a closed position, and an unlatched position wherein the strike-engaging formation is withdrawn to permit the door panel to move from its closed position to an open position; and,

(ii) an elongate operating formation which is movable between a nested position relative to the forwardly-facing recess, and an extended position relative to the recess, the operating formation being configured to reside (1) in its nested position when the strike-engaging formation is in its latched position, and (2) in its extended position when the strike-engaging formation is in its unlatched position;

(c) a pawl pivotally connected to the body for movement between a retaining position wherein it engages the latch lever to releasably retain the latch lever with its formation in their nested, latched positions, and a releasing position wherein the pawl releases the latch lever thereby permitting the latch lever formations to be moved to their unlatched, extended positions;

(d) a tool-operable actuator connected to the body for movement between locked and unlocked positions, including:

(i) tool-receiving means for receiving a specially configured tool and being operable to move the actuator in response to movement of such received tool; and,

(ii) a cam surface which operably connects with the pawl, which permits the pawl to assume its retaining position when the actuator is in its locked position, and which effects movement of the pawl to its releasing position when the actuator is moved to its unlocked position;

(e) first biasing means for biasing the latch lever away from its latched, nested position, toward its unlatched, extended position; and,

(f) second biasing means for biasing the pawl away from its releasing position toward its retaining position.

4,413,850

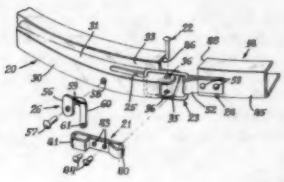
DRUM LOCK MECHANISM

Allen D. Siblik, 2409 Valley Dr., Lindenhurst, Ill. 60046

Filed Apr. 21, 1982, Ser. No. 370,179

Int. Cl.³ E05C *19/08*

U.S. Cl. 292—256.69 **3 Claims**



1. For use with a split metal clamp ring adapted to secure a cover over the open end of a drum container, a lever operated mechanism for radially expanding and contracting the clamp ring, comprising: a second class lever having an elongated passageway intermediate its ends and extending laterally therethrough, fulcrum means pivotally securing one end of said lever to one end of the clamp ring, articulated linkage means slidably connected to said lever via said elongated passageway therein, means pivotally anchoring said linkage means to the other end of the clamp ring whereby said linkage means bridges the split between the ends of the clamp ring so that pivotal movement of said lever serves to move said linkage means along said elongated passageway; movement of said lever to effect contraction of the clamp ring causing said linkage means to move toward said fulcrum means as the load on said lever increases to correspondingly increase the mechanical advantage of said second class lever, and latch means movable through said elongated passageway when said lever is moved to a position for closing the clamp ring; said latch means also interlocking with the clamp ring to prevent movement of said lever in a ring opening direction until released therefrom.

4,413,851

RETAINER STRAP FOR GARBAGE CAN LID

Herbert W. Ritter, 13677 Torrey Pines Dr., Auburn, Calif. 95603

Filed May 26, 1981, Ser. No. 267,366

Int. Cl.³ E05C *19/18*

U.S. Cl. 292—259 **4 Claims**

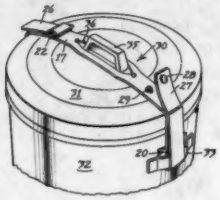
1. A retainer device for detachably holding a lid having a top handle in closed position upon an open-top receptacle having a pair of opposed open-loop side handles, comprising:

(a) an elongated flexible strap member having first and second end portions,

(b) adjustable securing means on said strap member for holding said first end portion folded back upon itself in different positions to form an adjustable first loop adapted to extend through one of the open-loop side handles of the receptacle,

(c) a first fastener member fixed on said strap member adjacent the extremity of said second end portion,

(d) a second fastener member manually detachably cooperative with said first fastener member and fixed on said strap member sufficiently spaced from said first fastener member so that the cooperative engagement of said first and second fastener members forms a second loop adapted to



extend through and be secured to the other open-loop side handle in operative position, when said strap member extends across the top of the lid in closed position,

(e) said first and second fastener members being manually detachable from each other to open said second loop in an inoperative position, and to permit said strap member to be removed from the corresponding open-loop side handle.

4,413,852

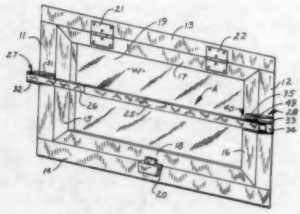
WINDOW SECURITY DEVICE

Elvin W. Burnell, McClain Rd., R.D. 5, Ashland, Ohio 44805, and David Deschner, 563 Highland Ave., Mansfield, Ohio 44903

Filed Mar. 3, 1982, Ser. No. 354,509

Int. Cl.³ E05C *9/18*

U.S. Cl. 292—259 **7 Claims**



1. A security device to prevent entry through windows and the like located in a wall structure, said device comprising:

a bar adapted to extend across said window and being pivotable about one end between an intial position extending outwardly from said wall structure and a security position extending generally parallel to said wall structure,

locking bracket means adapted for mounting on said wall structure adjacent said window,

lock means for releasably securing the other end of said bar to said locking bracket means,

pivot bracket means adapted for mounting on said wall structure on the other side of said window,

removable pivot pin means for pivotally connecting said one end of said bar to said pivot bracket means, and

means associated with said pivot bracket means for blocking removal of said pivot pin means when said bar is in its security position while premitting removal of said pivot pin means when said bar is in its initial position.

4,413,853

LIFTING MEANS FOR GOODS

Sten Andersson, Torpadala, P.O. Box 1683, S-430-33 Fjäras, Sweden

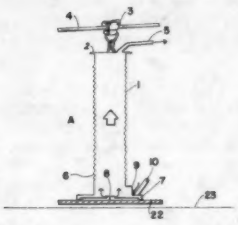
PCT No. PCT/SE81/00030, § 371 Date Sep. 16, 1981, § 102(e) Date Sep. 16, 1981, PCT Pub. No. WO81/02289, PCT Pub. Date Aug. 20, 1981

PCT Filed Feb. 3, 1981, Ser. No. 306,611

Claims priority, application Sweden, Feb. 4, 1980, 8000861; Sep. 22, 1980, 8006607

Int. Cl.³ B66C *1/02*

U.S. Cl. 294—64 R **11 Claims**



1. Lifting apparatus connectable to a fixed or movable anchoring point and having an object engaging portion capable of vertical movement in relation to the anchoring point, comprising:

a tubular container having a vertically oriented axis and closed upper and lower ends, said upper end being connectable to said anchoring point, said lower end comprising an annular seal for engaging a surface of an object to be lifted, for forming a substantially airtight seal against said surface, and for gripping said object when the interior of said container is evacuated and the vacuum within the container is communicated to a space encompassed by said seal;

at least a portion of the wall of said container being compressible or foldable in the axial direction to reduce the length of the container in the axial direction when the interior of the container is at least partially evacuated;

a vacuum port communicating with the interior of said container, said port being adapted for connection to a source of vacuum;

a vacuum break door in the wall of said container, said door when opened communicating with the interior of said container to the atmosphere to break the vacuum within the container and thereby release said object, said door having a hatch therein which, when opened, reduces the vacuum within said container to thereby allow the length of the container to increase; and

an actuating means for successively opening said hatch and door, said actuating means having (i) a first position wherein only the hatch is opened to gradually lower said seal and (ii) a second position wherein said door is opened to release said object.

4,413,854

DUAL DECK CONSTRUCTION FOR A HATCHBACK TYPE AUTOMOBILE

Gerald P. Hirshberg, Del Mar, Calif., assignor to Nissan Design International, Inc., La Jolla, Calif.

Filed Oct. 19, 1981, Ser. No. 312,548

Int. Cl.³ B60J *5/10*

U.S. Cl. 296—146 **15 Claims**

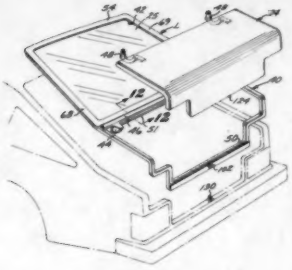
1. A dual deck construction for a hatchback type automobile, the body of such automobile having a trunk, said construction including:

an upwardly-facing trunk opening in the body of said automobile;

a forward deck defining the front portion of the floor of said trunk;

a rear deck defining the rear portion of said trunk floor extending rearwardly from the rear of said forward deck and contiguous therewith;

a liftgate for covering said opening and having a front deck lid overlying at least the major portion of said forward deck, and a rear deck lid overlying said rear deck, said



rear deck lid being hinged to said liftgate at the approximate juncture of said forward and rear decks;

hinge means connecting the front of said liftgate to the rear top portion of said automobile body along the front of said trunk opening; and

with the rear lid being openable independently of said front lid to afford access to said rear deck, and the entire liftgate being openable to afford simultaneous access to both the forward and rear decks.

4,413,855

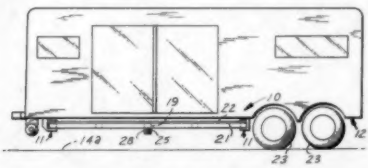
SLIDING PATIO FOR TRAVEL TRAILERS AND MOBILE HOMES

Francis Flanagan, Rte. 4, Box 57-F, Athens, Tex. 75751

Filed Jul. 15, 1981, Ser. No. 283,559

Int. Cl.³ B60G 3/32

U.S. Cl. 296—162 **8 Claims**



1. A travel trailer or mobile home, having a patio that is slidable between a stored-away and utility positions, comprising, in combination, a chassis mounted at its rear upon wheels, a hitch at the front of said chassis for support from the rear of a towing vehicle, a trailer body upon said chassis, and a retractable patio assembly mounted on an underside of said chassis, said patio assembly comprising a pair of parallel, spaced-apart channels affixed to said chassis underside, grooves of said channels facing each other, so as to form guide rails, a frame slidably supported in said guide rails, and being sidewardly slidable partly outward from under said chassis, a plywood panel mounted upon said frame, a carpet mounted upon said panel, a hand rail hinged along edges of said frame, and being pivoted downwardly against the top of said carpet, when said frame is in slided position under said chassis, a protective cover affixed between said channels extending across the top of said downwardly pivoted hand rail, and preventing roadway mud from being splashed upon said carpet, a pair of locking pins removably secured in said channels and said frame for preventing accidental sliding of said frame from under said chassis during travel of said travel trailer or mobile home, a plurality of angled hand rail brackets being removably received in sleeves affixed to said frame, for rigidly holding said hand rail in vertically upright pivoted position, when said frame is in said outwardly slided position, for the safety of persons upon said patio, a pair of downwardly adjustable caster units removably attachable to outward corners of said frame, for support upon the ground when in said outwardly slided position, and a downwardly adjustable stabilizer secured under the center of said frame, for resting upon said ground when in said outwardly slided position.

4,413,856

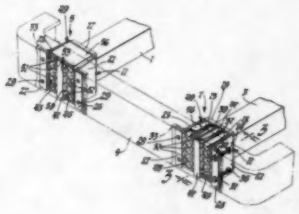
HARDBAR ENERGY ABSORBING BUMPER SYSTEM FOR VEHICLES

David R. McMahan; Gary P. Zeller, both of Anderson; Ronald W. Slaughter, Pendleton; Martin D. Skirha, and Dean M. Bayer, both of Anderson, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 7, 1981, Ser. No. 290,827

Int. Cl.³ B60R 19/04

U.S. Cl. 296—188 **5 Claims**



3. In a vehicle, an energy-absorbing unit for mounting a rigid, bumper assembly outwardly of and across one end of the vehicle to substantially rigid support structure of the vehicle comprising a resilient mounting bracket having at least one pair of laterally spaced side wall portions interconnected at one end by an end wall, at least one of said side wall portions having attachment means formed adjacent the other end thereof, first and second fastener means extending respectively through said end wall and said attachment means for connecting said mounting bracket to said bumper assembly and to said rigid support of said vehicle, and a discrete resilient energy absorbing medium separate from said bracket and interposed within the confines of said walls of said bracket for deflecting and absorbing impact energy from an impact load displacing said bumper assembly from a pre-impact position toward said support structure, and said mounting bracket having leg means for increasing the spring rate of the unit.

4,413,857

SEAT COVER

Kazuo Hayashi, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 3, 1980, Ser. No. 203,463

Claims priority, application Japan, Nov. 6, 1979, 54-153946[U]

Int. Cl.³ A47C 7/72

U.S. Cl. 297—180 **4 Claims**

1. In a seat cover to be mounted on a vehicle seat and used as a heater and as a ventilator, comprising:

a flat main body including a core which consists of resilient material and defines therein an air passage;

a motor-driven blower which discharges air from one side of the main body through the air passage in the core;

an electric heater which is disposed on the other side of the main body, the improvement which comprises:

said core including a flexible base plate formed with a num-

ber of holes and a plurality of relatively rigid, pin-shaped projections which project independently of each other from both sides of the base plate to define therebetween said air passage; said one side of the main body being

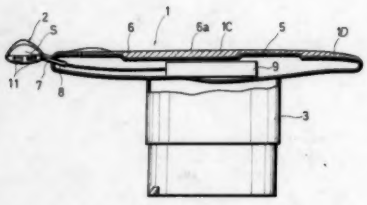
covered by a plastic sheet having holes and a cushion layer which provides sufficient air permeability to permit passage of air therethrough; said cushion layer being covered by a trimming sheet and a plastic sheet disposed on said other side of the base plate under said heater.

4,413,858

DENTAL CHAIR

Raymond D. Beach, 8Ban-2Go, Wada-Cho, Atami-Shi, Shizuoka Prefecture, Japan 413

Filed Dec. 4, 1980, Ser. No. 213,021
Int. Cl.³ A47C *7/62*
U.S. Cl. 297—188 **4 Claims**



1. A dental chair comprising:

(a) an integral frame having a substantially flat horizontal upper surface and including four notched flat surface areas disposed longitudinally thereof, wherein a surface area disposed intermediate the ends of the frame and a surface area disposed at the rear portion of the frame are flattened below the remaining two flat surface areas of the frame;

(b) a cushioning material carried on the frame and including portions thereof being thicker at those surface areas flattened below the remaining surface area;

(c) a headrest supported at a front end of the chair;

(d) means positioned on at least one side of the headrest and supported for free insertion into and removable from the chair for holding at least one tube instrument;

(e) the front portion of the chair adjacent to the headrest being wider than the rear portion of the chair;

(f) the front portion of the chair having a peripheral edge curved into an arcuate configuration for conforming to the contour of the shoulders of the patient; and

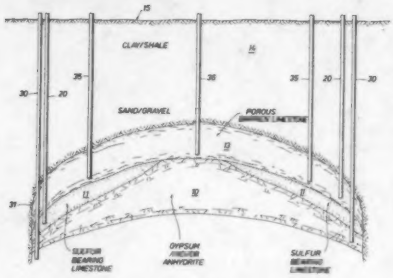
(g) the rear portion of the chair having a peripheral edge curved into an arcuate configuration, with the latter being smaller than the arcuate configuration of the front portion of the chair.

4,413,859

MINING OF SULPHUR WITH FOAM BARRIER

Stewart H. Folk, Houston, Tex., assignor to Stewart Folk & Company, Incorporated, Houston, Tex.

Filed Aug. 3, 1981, Ser. No. 289,783
Int. Cl.³ E21C *41/14*
U.S. Cl. 299—4 **6 Claims**



1. The method of mining sulphur from subterranean formations containing sulphur-bearing zones below an adjacent porous zone comprising the steps of:

developing, in the adjacent porous barren zone, a layer of pseudoplastic foam dispersion throughout the zone overlying the sulphur-bearing zones;

heating the sulphur-bearing zone below the form dispersion independently of the introduction of the foam dispersion;

maintaining the heating in the sulphur-bearing zone a sufficient time to convert the elemental sulphur to a liquid; and

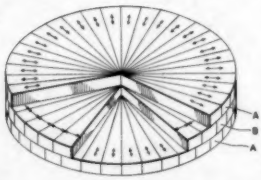
removing the liquid sulphur from the sulphur-bearing zone to the earth's surface while maintaining the layer of foam dispersion above the sulphur-bearing zone.

4,413,860

COMPOSITE DISC

Roger Prescott, Johnson City, Tenn., assignor to Great Lakes Carbon Corporation, New York, N.Y.

Filed Oct. 26, 1981, Ser. No. 315,143
Int. Cl.³ B32B *5/12*; B60B *5/02*
U.S. Cl. 301—63 PW **9 Claims**



1. A fiber reinforced composite disc comprised of a plurality of plies consisting of (A) and (B) wedge-shaped isosceles triangular segments cut from a parallel lay-up fiber-resin prepreg tape with the angle at the vertex of the two equal sides of no more than 60°, said vertex being coincident with the center of each of said plies of said disc, a line bisecting said vertex angle to the midpoint of the base of said isosceles triangular segment opposite said vertex being coincident with a radius of said disc, each of said (A) segments having fibers approximately parallel to said radius and normal to said base, each of said (B) segments having fibers approximately normal to said radius and approximately parallel to said base, each of said plies consisting of all said (A) or all of said (B) segments laid up with the sides of equal length abutting and coincident with radii of said disc, said bases forming a regular polygon defining a rim, said plies stacked with the centers in alignment and the edges defined by

said sides of equal length of said segments off-set between said plies.

4,413,861

FLUID PRESSURE CONTROL VALVE UNIT OF THE INERTIA-CONTROLLED TYPE

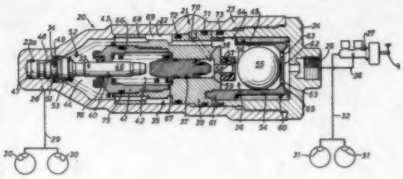
Takashi Nagashima, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed May 19, 1982, Ser. No. 379,730

Claims priority, application Japan, May 25, 1981, 56-78852; Jul. 13, 1981, 56-103556[U]

Int. Cl.³ B60T *8/14, 13/06*

U.S. Cl. 303—6 C **6 Claims**



1. A fluid pressure control valve unit for incorporation between a master cylinder and a wheel brake cylinder in a vehicle braking system, comprising:

a housing adapted to be fixedly mounted at an inclined angle on a vehicle body structure, said housing being provided at opposite ends thereof with an inlet port for connection to said master cylinder and an outlet port for connection to said wheel brake cylinder and provided therein with a stepped bore in open communication with said outlet port at its small diameter portion;

a first partition member secured in position within said housing to provide first and second chambers respectively in open communication with said outlet port and said inlet port, said first partition member being formed at its peripheral portion with a communication passage for providing a fluid communication between said first and second chambers and being formed with an axial bore opening toward said second chamber;

a second partition member fixedly coupled in a fluid-tight manner with said first partition member to provide a space between said first and second partition members;

a stepped piston slidably disposed within said stepped bore of said housing in said first chamber and extending at one end thereof through said second partition member into said space;

valve means cooperable with said stepped piston for controlling intercommunication between said first chamber and said outlet port in dependence upon axial movement of said stepped piston;

a first spring for biasing said piston in the direction toward a position in which said valve means is opened to permit fluid flow between said first chamber and said outlet port;

a control plunger slidably disposed within said axial bore of said first partition member to provide a third chamber in open communication with said second chamber, said control plunger being arranged to be brought into abutment at its one end with the extending end of said piston;

an inertia-controlled valve assembly including a valve seat provided on said first partition member to permit fluid flow into said third chamber from said second chamber, and an inertia-controlled valve element disposed within said second chamber for normally permitting fluid flow between said second and third chambers but adapted to cooperate with said valve seat to cut-off the fluid communication when said valve element is subjected to a deceleration in excess of a predetermined value; and

a second spring disposed within said space for biasing said control plunger toward said third chamber.

4,413,862

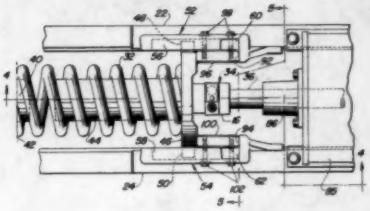
TRACK RECOIL SYSTEM

Danny L. Ragon, East Dubuque, Ill., assignor to Deere & Company, Moline, Ill.

Filed Nov. 17, 1980, Ser. No. 207,167

Int. Cl.³ B62D *55/30*

U.S. Cl. 305—10 **3 Claims**



1. In combination with a track frame for a track-laying tractor, a recoil system for yieldably maintaining track tension comprising: said frame including a pair of transversely spaced track-adjuster guides defining horizontal channels opening toward each other and front and rear end walls closing opposite ends of each of said channels; said front walls projecting towards each other beyond said channels and each defining a rearwardly facing abutment surface; each track-adjuster guide being provided with an access opening leading vertically into the channel adjacent said front wall; a first stop fixed to the frame at a location spaced rearwardly from said track-adjuster guides; a coil compression spring having one end engaged with said stop and a second end located between said track-adjuster guides; an extensible and retractable hydraulic track adjuster having a flange engaged with said second end of the spring and said flange including a pair of oppositely projecting tabs respectively slidably received in said channels defined by said pair of track-adjuster guides; said tabs being dimensioned to pass through said access openings and being located so as to pass through said access openings only when said spring is in an unloaded state; and a pair of preload spacer blocks respectively releasably secured to said pair of track-adjuster guides in sandwiched relationship between said flange and said rearwardly facing abutment surfaces, whereby said spacer blocks establish a preselected preload in said spring and transfer all forces exerted thereon as a result of the action of the spring directly to said frame.

4,413,863

HYDROSTATIC SUPPORT DEVICE

Jean Lombard, Boulogne sur Seine, France, assignor to Centre d'Etudes et de Recherches de la Machine-Outil (C.E.R.M.O.), France

Filed Jul. 30, 1981, Ser. No. 288,508

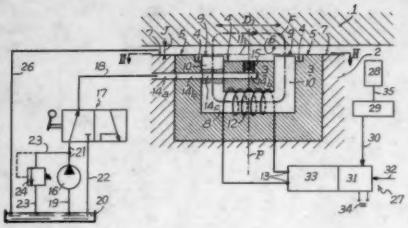
Claims priority, application France, Aug. 7, 1980, 80 17452

Int. Cl.³ F16C *32/06, 39/06*

U.S. Cl. 308—5 R **6 Claims**

1. Hydrostatic support device for movably supporting one element above another element comprising: (a) at least one hydrostatic guide block mounted on one of said elements; (b) at least one magnet mounted on one of said elements such that the other element is traversed by the lines of magnetic forces thereby pulling the elements toward each other; and (c) demagnetizing means associated with the magnet, said demagnetizing means comprising an electromagnet electrically con-

nected to an A.C. power source, and located such that the poles of the electromagnet extend beyond each hydrostatic guide block and are offset with respect to the active face of said guide block.



4,413,864

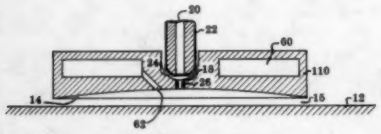
GAS BEARING

Edward H. Phillips, Middletown, Calif., assignor to Optimetrix Corporation, Mountain View, Calif.

Filed Jul. 31, 1981, Ser. No. 288,680

Int. Cl.³ F16C *32/06*

U.S. Cl. 308—5 R **18 Claims**



1. A gas bearing for supporting a load in a high precision apparatus having a fixed bearing surface, the gas bearing comprising:

a gas inlet;

a body having a concave pocket formed in a surface thereof opposed to the fixed bearing surface, said body having a circular periphery and having first and second openings in the pocket;

a first passage through a portion of the body connected to the gas inlet and the first opening;

first restrictive means for restricting the flow of gas through the first passage;

an enclosed chamber in the body, said chamber being associated solely with said pocket;

a second passage through a portion of the body connected to the chamber and the second opening;

second restrictive means for restricting the flow of gas through the second passage; and

mechanical coupling means for coupling the body to the load.

4,413,865

MARINE PROPULSION DEVICE INCLUDING BEARING HEAD RETENTION MEANS

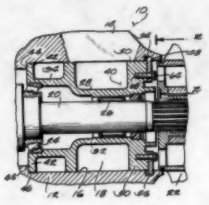
Eugene R. Hackbarth, Kenosha, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed May 26, 1981, Ser. No. 267,260

Int. Cl.³ F16C *19/26*

U.S. Cl. 308—207 R **11 Claims**

1. A lower unit for a marine propulsion device comprising a drive shaft housing having a lower end, a gearcase housing connected to said lower end of said drive shaft housing and having an interior wall defining an elongated cavity having a longitudinal axis, said interior wall including a shoulder extending transversely to said longitudinally axis, a first surface portion located in longitudinally spaced relation to said shoulder and transverse to said longitudinal axis of said elongated cavity, and a second surface portion located in longitudinally spaced relation to said shoulder and transverse to said longitudinal axis and spaced circumferentially from said first surface portion, a propeller shaft located in and extending axially through said gearcase housing cavity, a propeller supported on said propeller shaft, means for rotatably supporting said propeller shaft inside said gearcase housing and including a hollow bearing carrier member which is in encircling relation with said propeller shaft, said bearing carrier member being supported by said interior wall of said gearcase housing in abutting engagement with said shoulder and carrying a bearing rotatably engaging said propeller shaft, and means for anchoring said bearing carrier member to said gearcase housing and in said butting engagement with said shoulder, said means for anchoring including a pair of anchoring members, one of said anchoring members being engageable with said first surface portion, and the other of said anchoring members being engageable with said second surface portion, and means on said bearing carrier member and on said one anchoring member for forcing said one anchoring member toward said bearing carrier member and causing engagement of said one anchoring member against said first surface portion and said abutting engagement of said carrier with said shoulder, and means on said bearing carrier member and on said other anchoring member for forcing said other anchoring member toward said bearing carrier member and causing engagement of said other anchoring member against said second surface portion and said abutting engagement of said carrier with said shoulder.



4,413,866

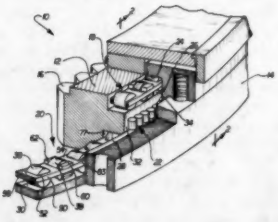
BEARING ASSEMBLY WITH WEAR PADS

James W. Geisey, Kent, Ohio, assignor to Rotek Incorporated, Aurora, Ohio

Filed Jun. 8, 1982, Ser. No. 386,249

Int. Cl.³ F16L *33/46*

U.S. Cl. 308—217 **15 Claims**



1. A bearing assembly for use between first and second relatively movable parts having a first longitudinally extending raceway connected with the first part and a second longitudinally extending raceway connected with the second part, said bearing assembly comprising a plurality of rotatable bearing elements which are movable along the first and second raceways upon relative movement between the first and second

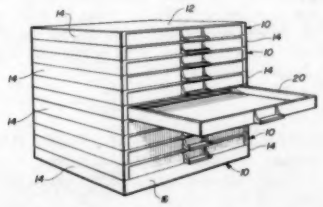
parts, said bearing elements having outer surfaces which are adapted to roll along central portions of the first and second raceways during relative movement between the first and second parts, longitudinally extending cage means for maintaining a desired spacing between said bearing elements as they move along the first and second raceways, said cage means includes first and second spaced apart and longitudinally extending side sections, connector sections extending between said first and second longitudinally extending side sections and cooperating with said side sections to at least partially define a plurality of openings in which said bearing elements are disposed, each of said first and second side sections having a first longitudinally extending side surface facing toward the first raceway, a second longitudinally extending side surface facing toward the second raceway, and inner side surfaces extending between said first and second longitudinally extending side surfaces and partially defining the openings in said cage means, and wear pad means for positioning said cage means in a desired position relative to the first and second raceways as said bearing elements move along the first and second raceways, said wear pad means including first surface means for slidably engaging one of the raceways at a location disposed to one side of the central portion of said one raceway and second surface means for slidably engaging the one raceway at a location disposed to a side of the central portion of the one raceway opposite from the one side, said first and second surface means being spaced apart by a distance which is at least substantially as great as the width of the central portion of the one raceway, said central portion of the one raceway being substantially free of sliding engagement with said wear pad means, said wear pad means includes a plurality of wear pad members each of which extends through one of the openings in said cage means, each of said wear pad members is releasably connected with said cage means, each of said wear pad members extends through one of the openings at a location between one of said rotatable bearing elements and an inner side surface of one of said longitudinally extending side sections, each of said wear pad members includes a first portion abutting said first longitudinally extending side surface of said cage means and a second portion abutting said second longitudinally extending side surface of said cage means, said second portion of said wear pad member slidably engaging a side portion of the second raceway at a location disposed to one side of the central portion of the second raceway.

4,413,867

MULTI-UNIT STORAGE CABINET

Dennis R. Mosebrook, Spring Grove, and Wayne C. Seeley, York, both of Pa., assignors to Dentsply Research & Development Corp., Milford, Del.

Filed Jun. 17, 1981, Ser. No. 274,689
Int. Cl.³ F16B *12/00*; A47F *5/00*
U.S. Cl. 312—111 **3 Claims**



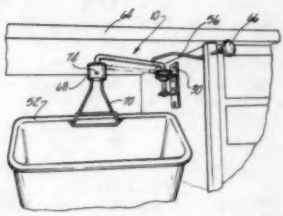
1. A storage cabinet comprising a plurality of identical shell-like sections molded from plastic material and characterized by each section having a substantially rectangular planar panel integral at three edges with opposite sidewalls and a rear wall of uniform height and connected at the ends to each other to form a continuous U-shaped configuration and a front opening similar in area to said rear wall, said sections being arranged in a vertical stack with the planar panels uppermost and the openings disposed commonly in a vertical front plane except the lowermost section which has the rear wall in said vertical front plane to comprise a base section having the open face of the shell lowermost and the planar panel of the uppermost section comprising a top of the cabinet, holes in said sidewalls adapted to receive self-tapping screws of no greater length than the height of said sections and said screws extending substantially equally between immediately adjacent sections to secure the sections into a unitary assembly and leave substantially one-half of the depth of the holes in the uppermost section to receive additional screws, the inner surfaces of the planar panel of each section being provided with short molded reinforcing ribs extending thereacross of uniform depth and the edge of the planar panel adjacent said front opening having a narrow flange adjacent said front opening extending toward said opening and having a depth at least equal to the depth of the ribs, and similar drawers of complementary area and height to the spaces in each section slidably supported in all sections except the lowermost base section.

4,413,868

RETRACTABLE RECEPTACLE SUPPORT MECHANISM

Mitchell F. Gorkiewicz, 619 E. Sixth St., Royal Oak, Mich. 48067

Continuation-in-part of Ser. No. 185,339, Sep. 8, 1980. This application Jan. 15, 1981, Ser. No. 225,431
Int. Cl.³ A47B *81/00*
U.S. Cl. 312—211 **12 Claims**



1. A device for moving a receptacle into and out of a housing, said device comprising:

means for mounting the device to the housing;

a receptacle support;

a carrier arm rotatably connected at one end to said housing and rotatably connected at the other end to said support;

an actuator rod connected to said arm and movable into and out of said housing so as to rotate said arm about said one end;

means connected to said support for maintaining the orientation of said support relative to the housing at all rotational positions of said arm;

whereby a receptacle may be moved into and out of said housing while being maintained in the same orieintation relative to the housing regardless of the position of said arm; and

wherein said maintaining means comprises a first sprocket affixed to said housing and connected to said one end of said arm so that said arm is rotatable in said first sprocket;

a second sprocket connected to the other end of said arm and affixed to said support so that said second sprocket and said support affixed thereto are rotatable about said other end; and

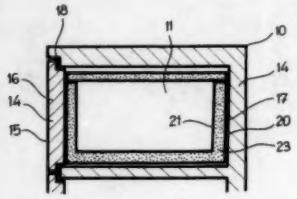
a chain mounted on and indexing on said sprockets, whereby said chain plays onto and off from the sprockets with movement of the actuator rod thereby maintaining the orientation of the receptacle.

4,413,869

HEAT RESISTANT CABINET AND METHOD OF MANUFACTURE

Günther Pichler, Germersheim; Friedrich Rothhaas, and Hans Hock, both of Bellheim, all of Fed. Rep. of Germany, assignors to Sistemco N.V., Willemstad, Netherlands Antilles

Continuation-in-part of Ser. No. 244,863, Mar. 18, 1981, abandoned. This application Mar. 26, 1981, Ser. No. 247,782
Claims priority, application Switzerland, Mar. 18, 1980, 2114/80
Int. Cl.³ A47B 81/00; C09K 5/06, 3/28; E05G 1/12
U.S. Cl. 312—236 21 Claims



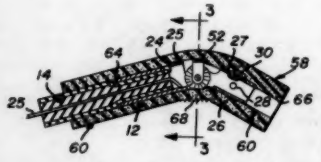
1. A heat resistant cabinet having at least one compartment for storing temperature-sensitive articles, said compartment being surrounded by a heat absorbing layer consisting essentially of a particulate or powdery mixture of a heat absorbing material having a large heat of fusion and at least about 10% by volume of a binder material, said binder material being a water absorbing inorganic material selected from the group consisting of plaster of paris, caustic lime, and cement which when the heat absorbing material becomes liquid, binds said liquid heat absorbing material to form therewith a doughy mass or a solid mass.

4,413,870

PIVOTABLE SPARK PLUG CONNECTOR

Justyn J. Labutski, III, 1557 Hearthstone Dr., San Jose, Calif. 95122

Filed Jul. 30, 1981, Ser. No. 288,458
Int. Cl.³ H01R 13/62
U.S. Cl. 339—6 R 10 Claims



1. A pivotable spark plug connector apparatus comprising, in combination:

(a) wire clamp means for being mounted on ignition wire;

(b) a spark plug terminal receptacle means for removably receiving a spark plug terminal; and

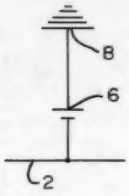
(c) position-retaining means associated with the wire clamp means and the terminal receptacle means for pivotally connecting one to the other in a position-retaining manner, said position-retaining means including two identical pairs of disc portions, one of the pairs being the mirror image of the other of the pairs, with the pairs being disposed in spaced relation, and bias means arranged between the pairs of cooperating disc portions for exerting a force against each of the pairs.

4,413,871

EARTH CONNECTION CONNECTOR HAVING PROVISION FOR AN ELECTRICAL COMPONENT

Robert C. Swengel, Jr., York, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 10, 1981, Ser. No. 329,165
Int. Cl.³ H01R 4/66
U.S. Cl. 339—14 R 7 Claims



1. An electrical connector for connecting a first lead extending from a component, such as a capacitor, to a through- conductor and for connecting a second lead extending from the component to a tap conductor, the connector being of the type comprising an insulating housing having a recess extending inwardly from one surface thereof, the recess being dimensioned to receive the component and first and second terminals, the first terminal having a wire-receiving slot therein for reception of the first component lead and the second terminal having a wire receiving slot for reception of the second component lead, the connector being characterized in that:

a through conductor terminal is located beside the housing and proximate to the first terminal, the through conductor terminal having a wire-receiving slot for reception of the through conductor, the through conductor terminal and the first terminal being connected to each other by a connecting section which extends through a wall of the housing,

the second terminal has a tap conductor terminal integral therewith, the tap conductor terminal being of the disconnect type and being dimensioned to receive a complementary disconnect type terminal upon movement of the complementary terminal into the recess,

a sheet metal cover is provided for the recess, the cover having the complementary disconnect type terminal extending therefrom and located to mate with the tap conductor terminal when the cover is assembled to the housing in covering relationship to the recess, the sheet metal cover being the tap conductor whereby,

upon placement of the component in the recess with the first and second leads received in the wire-receiving slots of the first and second terminals, and upon placement of the through conductor in the wire-receiving slot of the through conductor terminal, and upon assembly of the cover to the housing, the first lead of the component will be connected to the through conductor and the second lead of the component will be connected to the tap conductor.

4,413,872

PRELOADED ELECTRICAL CONNECTOR

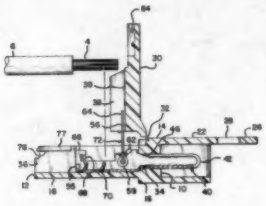
William J. Rudy, Jr., Annville, Pa., and John A. Zimmerman, Jr., Cape Coral, Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Filed May 11, 1981, Ser. No. 262,011
Int. Cl.³ H01R 13/422
U.S. Cl. 339—59 M 15 Claims

1. A preloaded electrical connector of the type comprising an insulating housing having a mating face and a wire entry face, oppositely facing sidewalls and oppositely facing endwalls extending between said faces, at least one terminal receiving cavity extending through said housing from said wire entry face to said mating face, a terminal in said cavity, said

terminal having a wire connecting portion which is proximate to said wire entry face, one of said sidewalls having an integral housing flap which is hinged to said one sidewall at a location intermediate said faces, said housing flap being in an open position whereby a rearward portion of said cavity is exposed on one side thereof, said housing flap being movable to a closed position in which said cavity is closed on said one side, said connector being characterized in that:

said wire connecting portion of said terminal has a wire receiving portion and a wire clamping flap, said clamping flap being hinged to said terminal at an intermediate location thereon and being in an open position, said clamping flap extending beside said housing flap, said clamping flap being between said housing flap and the rearward end of said terminal,



said clamping flap being movable to a closed position with said housing flap when said housing flap is moved to said closed position whereby,

upon positioning the end portion of a wire adjacent to and in alignment with said wire receiving portion of said terminal and moving said housing flap to said closed position, said clamping flap is moved to its closed position and said wire is clamped to said wire receiving portion of said terminal,

said wire receiving portion of said terminal and said clamping flap having first interengaging means to hold said terminal flap in said closed position,

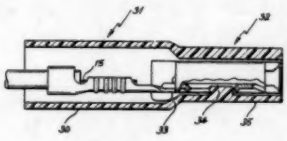
said housing and said housing flap having second interengaging means thereon to hold said housing flap in said closed position.

4,413,873

ELECTRICAL TAB RECEPTACLE

Walter Karl, Lugarno, Australia, assignor to Utilux Pty. Ltd., Australia

Filed Aug. 31, 1981, Ser. No. 298,341
Claims priority, application Australia, Sep. 17, 1980, PE 5606
Int. Cl.³ H01R *11/22*
U.S. Cl. 339—74 R **12 Claims**



1. (a) An electrical tab receptacle integrally formed from a single piece of sheet metal and comprising a forward portion and a rearward portion,

(b) the rearward portion being adapted to be connected to an electrical conductor and the forward portion having a generally channel-shaped receptacle portion for engaging in mating relationship with a complementary tab,

(c) the receptacle portion having a base and upstanding side walls which are turned in so as to have free edge portions in spaced confronting relation with the base, the arrangement being such that the tab is adapted to be received between said free edge portions and the base to form a connection, and characterised by

(d) the tab receptacle further comprising a resiliently displaceable engagement member extending from a side of the receptacle portion and a portion of the engagement member extending between the turned in portions of the side walls in a direction towards the base to provide an engagement element for engaging in latching engagement with a corresponding portion of the complementary tab,

(e) the engagement member having a release portion located outside the channel-shaped receptacle portion for receiving a displacement force to move the engagement element in a direction away from the base and towards the turned in portions of the side walls to permit disengagement of the engagement element from the complementary tab, and

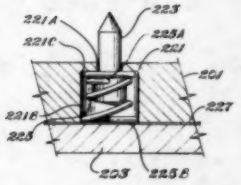
(f) the engagement element being biased to its latching position.

4,413,874

MULTIPLE CONTACT TESTING DEVICE

Robert A. Williams, 2721 White Settlement Rd., Fort Worth, Tex. 76107

Filed Feb. 27, 1981, Ser. No. 239,146
Int. Cl.³ H01R *4/48*
U.S. Cl. 339—151 B **5 Claims**



1. A device for electrically contacting a plurality of spaced contact means located inward of the surface of a base member, comprising:

first and second plates secured together,

said first plate having an outward facing forward surface,

said first and second plates being formed of electrically conductive material,

a plurality of spaced apart apertures formed through said first plate,

each aperture comprising a small portion extending through said forward surface of said first plate and an enlarged portion extending rearward from said small portion with a shoulder formed between said small portion and said enlarged portion,

said enlarged portion of each aperture having side wall means extending rearward from said shoulder to a rear wall formed by said second plate,

an electrical contact located partially in each of said apertures,

each contact having a forward end portion and a rear end portion with said forward end portion extending through said small portion of its associated aperture and beyond said forward surface of said first plate and with said rear end portion located in said enlarged portion of its associated aperture,

said rear end portion of each contact having a diameter greater than that of its forward end portion,

said rear end portion of each contact having means adapted to engage said shoulder of its associated aperture.

said enlarged portion of each of said apertures having a length sufficient to allow said rear end portion of its associated contact to move rearward and forward therein,

when said means of said rear end portion of each contact engages said shoulder of its associated aperture, said rear

end portion of said contact is spaced from said rear wall of its associated aperture,

an electrically conductive coiled spring located in each enlarged portion of said apertures for urging said means of said rear end portion of its associated contact toward said shoulder and said forward end portion of its associated contact beyond said forward surface of said first plate,

each coiled spring having a forward end surrounding and tightly engaging said rear end portion of its associated contact and a rear end seated against said rear wall of said enlarged portion of its associated aperture and tightly engaging said side wall means of said enlarged portion of its associated aperture.

4,413,875

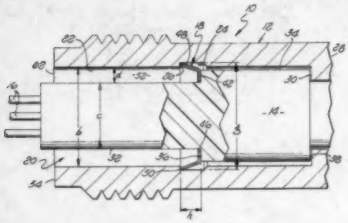
CONNECTOR RETAINING APPARATUS

William R. Mattingly, Santa Ana, Calif., assignor to Matrix Science Corporation, Torrance, Calif.

Filed Sep. 23, 1981, Ser. No. 304,738

Int. Cl.³ H01R *13/508*

U.S. Cl. 339—217 R **14 Claims**



1. A connector retaining apparatus for retaining an insulator insert in a shell comprising:

an insulator insert comprising:

an exterior surface,

an annular flange extending radially outwardly from the exterior surface to define a rear facing shoulder at a junction between the annular flange and the exterior surface, and

a front facing front shoulder;

a connector shell having an interior surface defining a centrally disposed bore for receiving the insulator insert, the interior surface having at least one rear facing stop shoulder extending radially inwardly therefrom, the stop shoulder positioned for abutting the front shoulder of the insulator insert when the insulator insert is inserted into the bore of the connector shell, the interior surface further having an annular groove disposed therein at a location rearward of the stop shoulder, the rearmost junction between the annular groove and the interior surface defining a front facing retaining shoulder, the retaining shoulder being located rearward of the rear facing shoulder of the insulator insert when the front shoulder of the insulator insert abuts against the stop shoulder of the connector shell; and

a retaining ring comprising:

a radial flange portion having an annular interior edge defining an orifice through the retaining ring, the radial flange portion abutting against the rear facing shoulder of the insulator insert, and

a frusto-conical portion extending rearwardly from the rear facing shoulder of the insulator insert and having a retention edge for abutting against the retaining shoulder of the connector shell whereby the insulator insert is prevented from rearward axial removal from the connector shell bore by the retaining ring between the retaining shoulder of the connector shell and the rear facing shoulder of the insulator insert, and the insulator insert is prevented from forward axial removal from the connector shell bore by the abutment of the front shoulder of the insulator insert against the stop shoulder of the connector shell.

4,413,876

FAIL-SAFE ELECTRICAL CONNECTION TERMINAL AND TIGHTENING TOOL

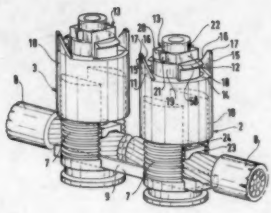
Andre Borne, Villeurbanne; Joseph Vallod, Caluire et Cuire, and Rene Curvat, Rillieux La Pape, all of France, assignors to Societe Anonyme dite: Cgee Alsthom, Levallois-Perret, France

Filed Oct. 1, 1981, Ser. No. 307,552

Claims priority, application France, Oct. 2, 1980, 80 21114

Int. Cl.³ H01R *4/30*

U.S. Cl. 339—244 B **4 Claims**



1. A fail-safe electrical connection terminal comprising: a slotted bolt for receiving an electrical conductor; a tapped cylindrical cap screwed onto the bolt to clamp the conductor therein, said cap being closed at one end by a plate having a central hole; a shoe for applying the clamping force to the conductor; a rod having one end integral with the shoe and being slidably mounted in said hole in the plate; and a compression spring interposed between the shoe and the plate of the cap, said shoe and spring being housed inside the cap; the improvement wherein the plate of the cap includes tightening means comprising two circumferentially spaced lugs projecting perpendicularly from the periphery of the plate, and a boss projecting from the center of the plate, said boss having two plane faces facing the spaces in between the lugs and having two hooks, one against each of said plane faces, the end of said central boss projecting axially beyond the ends of the hooks and being of polygonal shape with said two plane faces being capable of being received in a tool for tightening the cap.

4,413,877

SELECTIVELY LIGHT-TRANSMITTING LAMINATED STRUCTURE

Kazutomi Suzuki; Hitoshi Mikoshiba, both of Hino, and Yuji Mitani, Hachioji, all of Japan, assignors to Teijin Limited, Osaka, Japan

Continuation of Ser. No. 240,814, Mar. 5, 1981, abandoned. This application Nov. 1, 1982, Ser. No. 438,535

Claims priority, application Japan, Mar. 10, 1980, 55-24238; Jun. 2, 1980, 55-72679; Jun. 4, 1980, 55-74182; Jun. 4, 1980, 55-74183

Int. Cl.³ G02B *5/24*

U.S. Cl. 350—1.7 **24 Claims**

1. A selectively light-transmitting laminated structure having the following layers:

(1) a substrate layer (A) of a transparent sheet-like structure,

(2) a heat wave-reflective layer (D) of a silver-containing metal having a thickness of 50–300 Å,

(3) a single layer (C) deposited as elemental titanium (Ti) and having a thickness of 25 to 100 Å, or said layer (C) on each side of layer (D), said layers (C) having a minimum total thickness of 10 Å and a maximum total thickness of 100 Å,

(4) at least one transparent thin layer (B) having a thickness of 50–500 Å and a high refractive index, said layers being

in contact with each other in the order: (A)-(B)-(D)-(C), (A)-(B)-(D)-(C)-(B), (A)-(D)-(C)-(B), (A)-(B)-(C)-(D)-(C), (A)-(C)-(D)-(C)-(B) or (A)-(B)-(C)-(D)-(C)-(B) and (5) optionally, a transparent top layer (E).

4,413,878

IMAGING SYSTEMS

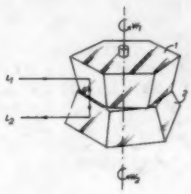
Alan H. Lettington, Malvern, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Sep. 13, 1978, Ser. No. 942,737

Claims priority, application United Kingdom, Sep. 13, 1977, 38158

Int. Cl.³ G02B *27/17*

U.S. Cl. 350—6.7 **3 Claims**



1. An imaging system for collecting radiation from a scene and producing an image of the scene, said system including first and second scanning rotors mounted on a common rotational axis, said first scanning rotor having a set of n_1 plane mirrors which extend around the first rotor axis, said second scanning rotor having a set of (n_1+n_2) plane mirrors which extend around the second rotor axis (where n_1 and n_2 are integers), wherein adjacent mirrors in said first and second sets are inclined at different angles to the axes of said first and second rotors respectively, and wherein the rotors are arranged such that radiation from said scene is reflected from one of said sets to the other, and means for driving the first rotor at

$$\frac{(n_1 + n_2)}{n_1}$$

x speed of the second rotor.

4,413,879

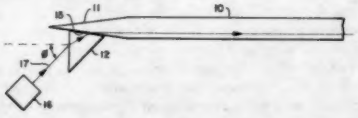
METHOD AND APPARATUS FOR SIDE LAUNCH EXCITATION OF SELECTED MODES IN GRADED-INDEX OPTICAL FIBERS

John W. Berthold, III, College Park, and Paul S. Szczepanek, Highland, both of Md., assignors to The United States of America as represented by the director of the National Security Agency, Washington, D.C.

Filed Oct. 15, 1979, Ser. No. 85,137

Int. Cl.³ G02B *5/172*

U.S. Cl. 350—96.19 **7 Claims**



1. An apparatus for exciting a selected mode in a graded-index optical fiber, comprising:

a graded-index multimode optical fiber which has been etched to a taper below the cladding layer;

a coupling medium having an index of refraction greater than that of the fiber cladding and contacting the tapered portion of the fiber; and

a source of light directed toward the coupling medium such that the light beam passes through the medium into the fiber.

4,413,880

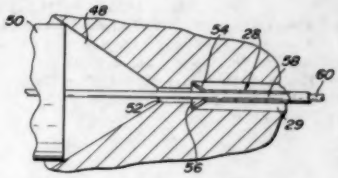
ADAPTABLE CONNECTOR FOR A FIBER OPTIC TESTING DEVICE

John W. Forrest, Acton, and Thomas DeFusco, Worcester, both of Mass., assignors to Bowmar/ALI, Inc., Acton, Mass.

Filed Jan. 2, 1981, Ser. No. 222,189

Int. Cl.³ G02B *7/26*

U.S. Cl. 350—96.20 **2 Claims**



1. An adaptable connector for connecting unterminated optical fiber cables to a test set or the like, comprising:

(a) an optical fiber adapter section having a cylindrical bore for receiving an unsheathed optical fiber of a fiber optic cable, the diameter of the bore being slightly larger than the outside diameter of the optical fiber whereby the fiber may be inserted in a sliding conformal fit in said bore;

(b) a cable adapter section having a cylindrical bore for receiving the fiber optic cable therein, said bore being coaxially aligned with the bore of the fiber adapter section, the cable adapter section having means to secure fiber optic cables of different diameters;

(c) a conical chamber disposed between the bore of the cable adapter section and the bore of the fiber adapter section, the axis of said conical section being coaxially aligned with the bores of the cable adapter section and the fiber adapter section, the base end of said conical chamber opening onto the bore of the cable adapter section and the apex end of said conical chamber opening onto the bore of the fiber adapter section, whereby the conical chamber guides the optical fiber into the bore of the fiber adapter section when the fiber optic cable is inserted into the connector;

(d) said optical fiber adapter section including a hollow metallic tube having one end thereof flared outward to form a second conical chamber to guide the optical fiber into the cylindrical bore of the optical fiber adapter section, said flared end also supporting the fiber adapter section in proper alignment within the conical chamber.

4,413,881

OPTICAL FIBER HERMETIC SEAL

Tibor F. I. Kovats, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

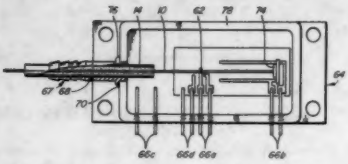
Continuation-in-part of Ser. No. 61,501, Jul. 26, 1979, abandoned. This application Oct. 19, 1981, Ser. No. 312,834

Int. Cl.³ G02B *7/26*

U.S. Cl. 350—96.20 **17 Claims**

1. An optical fiber hermetic seal comprising a mass of fusible alloy embracing a length of the fiber, the fusible alloy exerting pressure on the fiber at an interface between the alloy and the fiber, the alloy characterized by appreciable expansion during

solidification, the mass of fused alloy being generally cylindrical in shape, the fiber located on a central longitudinal axis of the cylindrical mass of alloy, and the mass of fused alloy being embraced by a hollow cylindrical tube.



4,413,882

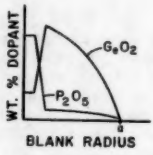
LOW VISCOSITY CORE GLASS OPTICAL FIBER

Alan C. Bailey, Painted Post, and Alan J. Morrow, Elmira, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 165,652, Jul. 3, 1980, Pat. No. 4,298,365. This application May 26, 1981, Ser. No. 266,745

Int. Cl.³ G02B *5/172*

U.S. Cl. 350—96.30 **8 Claims**



1. An optical waveguide fiber comprising a glass core surrounded by a layer of cladding glass having a refractive index lower than that of said core, the viscosity V_1 of the core glass being less than the viscosity V_2 of the cladding glass, said fiber being characterized in that it further comprises an axial region of low viscosity glass within said core, the viscosity V_1 being greater than the viscosity V_3 of said axial region, said viscosities being determined at that temperature at which said cladding glass has a viscosity of 10^{10} poise, there being an abrupt change in viscosity at the interface between said axial region and the remainder of said glass core.

4,413,883

DISPLAYS CONTROLLED BY MIM SWITCHES OF SMALL CAPACITANCE

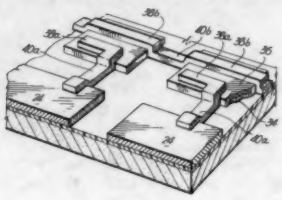
David R. Baraff, Ottawa; Nur M. Serinken, Kanata; Richard W. Streater, Nepean; Carla J. Miner, Nepean; Robert J. Boynton, Nepean; Blair K. MacLaurin, Nepean, and William D. Westwood, Nepean, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Continuation-in-part of Ser. No. 44,247, May 31, 1979, abandoned. This application Dec. 3, 1980, Ser. No. 212,271

Int. Cl.³ G02F *1/133*

U.S. Cl. 350—334 **24 Claims**

1. A matrix multiplexed display comprising a pair of plates, at least one of the plates being transparent, the plates having sealed therebetween a layer of liquid characterized by electric field dependent optical transmissivity, a first plurality of electrodes on an inside surface of one plate and a second plurality of electrodes on an inside surface of the other plate, the display having a plurality of picture elements, each element defined by a pair of opposed electrodes on the inside surfaces of respective plates, means for applying a voltage between the opposed electrodes of each element, each picture element being series connected to a respective switch comprising a thin insulating film flanked by thin film conducting layers, the insulating film characterized by a gross change in resistivity at a predetermined voltage thereacross, the switches formed on the inside surface of at least one of the plates, each switch having a capacitance substantially less than the capacitance of its series connected picture element.



4,413,884

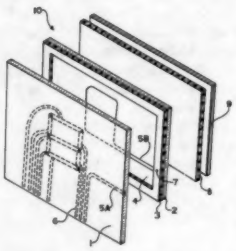
CASTING A THERMOPLASTIC-ALKALI EARTH METAL SALT REFLECTOR TO A LIQUID CRYSTAL DISPLAY

Joseph P. Ferrato, Stow, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Sep. 14, 1981, Ser. No. 301,553

Int. Cl.³ G02F *1/13*

U.S. Cl. 350—338 **50 Claims**



1. An electro-optical display comprising:

a front and back transparent plate disposed substantially parallel to each other;

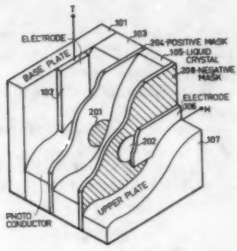
an electro-optical material disposed between the plates, said electro-optical material having an ability to transmit light that depends on whether the electro-optical material is in an electrically energized or an electrically un-energized state;

a layer of transparent electrically conductive material disposed on at least a portion of the side of each of the plates facing toward the electro-optical material as a means of imposing a controlled electrical field thereacross and electrically energizing the electro-optical material;

a reflector layer coasted on the side of the back plate facing away from the electro-optical material wherein said reflector layer is disposed adjacent to and adhered directly to the side of the back plate facing away from the electro-optical material, said reflector layer formed from a composition comprising a blend of from about 30% to about 99.9% by weight of at least one alkali earth metal salt with a mixture of at least one solvent and binder mixed in such amounts as to enable the composition to be cast as the reflector and upon evaporation of the solvent to bind the alkali earth metal salt sufficiently to provide said reflector layer with the ability to reflect light back towards the front plate that enters through the front plate and passes through the electro-optical material and the back plate and impinges upon the reflector while providing a high reflecting angle in conjunction with maintaining a high contrast ratio between the electrically energized state and

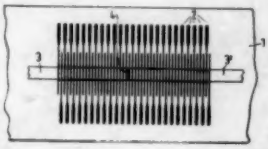
electrically un-energized state of the electro-optical material.

4,413,885
ELECTRO-OPTICAL DISPLAY DEVICE
Michel Hareng; Jean-Pierre Huignard, and Serge Le Berre, all of Paris, France, assignors to Thomson-CSF, Paris, France
Filed Feb. 11, 1980, Ser. No. 120,319
Claims priority, application France, Feb. 13, 1979, 79 03636
Int. Cl.³ G02F *1/135, 1/03*
U.S. Cl. 350—342 **4 Claims**



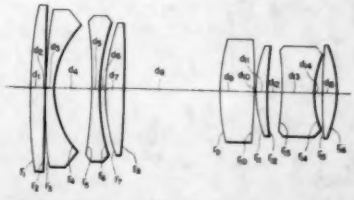
1. An electro-optical display device which comprises:
a layer of electro-optical material having a first and a second face;
at least a first electrode on the first face of said layer of electro-optical material;
a layer of photo-conducting material having a first face facing the second face of said electro-optical material layer and a second face;
at least a second electrode on the second face of said layer of photo-conducting material, defining with said first electrode at least one point of inscription and
means for causing to emerge through said second face of said layer of electro-optical material and at said point of inscription an incident light applied to said first face of said layer of electro-optical material when an electrical voltage greater than a given value is applied between said electrode; said light thus emerging at said point of inscription causing the resistivity of said photo-conducting material to drop at said point and thus increasing the effect of said electrical voltage on said layer of electro-optical material, wherein said electro-optical material presents a threshold of sensitivity of the electrical voltage, and the thickness of said layer of photo-conducting material allows an electrical voltage to be permanently applied between said two electrodes which is divided into a first fraction applied to said layer of photo-conducting material; said first fraction being less than said threshold of sensitivity, wherein there is further provided a first plurality of electrodes comprising said first electrode and a second plurality of electrodes comprising said second electrode; said two pluralities of electrodes defining a set of inscription points addressable in a matrix, wherein said electro-optical material is a liquid crystal presenting a twisted nematic structure; said means for causing the light to emerge comprising two polarizing films oriented in the said direction and situated respectively on each side of said liquid crystal layer, wherein a filter is further deposited on said second face of said layer of photo-conducting material to eliminate an external light capable of energizing said photo-conducting material through its second face, and a layer of fluorescent material deposited on said filter to emit under the action of said external light a light inactinic for said photo-conducting material and which passes through said filter to allow visualization by transmission of this inactinic light through the apparatus.

4,413,886
OPTICAL SWITCH
Joachim Lauckner, Korntal; Felix Lutz, Stuttgart; Gerhard Seibold, Remseck; Gerhard Wessel, Stuttgart, and Hans Volz, Schwieberdingen, all of Fed. Rep. of Germany, assignors to International Standard Electric Corporation, New York, N.Y.
Filed Jan. 26, 1981, Ser. No. 228,599
Claims priority, application Fed. Rep. of Germany, Jan. 29, 1980, 3002956
Int. Cl.³ G02F *1/05*
U.S. Cl. 350—392 **2 Claims**



1. In an optical switch:
an elongated baseplate of transparent non-double-refracting material;
first and second rows of interdigitated electrode strips of electrically conducting material on one surface of said baseplate extending lengthwise of said baseplate, said baseplate having a middle part and side parts on each side of said middle part running lengthwise of said baseplate;
said electrode strips being separate from and parallel to each other;
the strips of said first row extending over said middle part and one side part of said baseplate;
the strips of said second row extending over said middle part and the other side part of said baseplate;
each said electrode strip having an individual connection area on its respective side part of said baseplate; and
a strip of ferroelectric light permeable ceramic extending lengthwise of said baseplate, said ceramic strip being substantially narrower than said elongated baseplate so that said strip extends over only said middle part, said ceramic strip overlying and transversing said electrode strips and being secured to said middle part of the said baseplate.

4,413,887
ZOOM LENS SYSTEM
Tadashi Kimura, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Aug. 21, 1981, Ser. No. 294,824
Claims priority, application Japan, Aug. 29, 1980, 55-119566
Int. Cl.³ G02B *15/16*
U.S. Cl. 350—426 **4 Claims**



1. A zoom lens system
comprising a front lens group consisting of a first positive lens component, a second negative meniscus lens component having a convex surface on the image side, a third negative lens component, and fourth positive lens compo-

nent, and a rear lens group consisting of a fifth positive lens component, a sixth positive lens component, a seventh negative lens component and an eighth positive lens component, said zoom lens system being adapted to perform zooming operation by varying the airspace reserved between said front and rear lens groups and to satisfy the following conditions (1) through (9):

$$1.8<r_1/|f_F|<3.5 \quad (1)$$

$$6<r_3/|f_F|<9 \quad (2)$$

$$0.03<1/n_1-(1/n_2+1/n_3)/2 \quad (3)$$

$$1.75<n_7 \quad (4)$$

$$50<(\nu_2+\nu_3)/2 \quad (5)$$

$$0.18<(d_3+d_4+d_5)/|f_F|<0.3 \quad (6)$$

$$1.68<n_4 \quad (7)$$

$$3<|r_8|/|f_F| \quad (8)$$

$$0.35<(d_9+d_{13})/f_R<0.5 \quad (9)$$

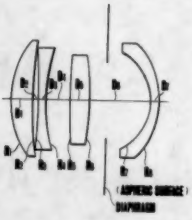
wherein the reference symbol r_1 represents radius of curvature on the object side surface of said first lens component, the reference symbol r_3 represents radius of curvature on the object side surface of said second lens component, the reference symbols n_1, n_2, n_3, and n_7 represent refractive indices of said first, second, third and seventh lens components respectively, the reference symbols ν_2 and ν_3 represent Abbe's numbers of said second and third lens components respectively, the reference symbols d_3 and d_5 represent thickness of said second and third lens component respectively, the reference symbol d_4 represents the airspace reserved between said second and third lens components, the reference symbol n_4 represents refractive index of said fourth lens component, the reference symbol r_8 represents radius of curvature on the image side surface of said fourth lens component, the reference symbols d_9 and d_{13} represent thicknesses of said fifth and seventh lens components respectively, the reference symbol f_F represents focal length of said front lens group, and the reference symbol f_R represents focal length of said rear lens group.

4,413,888

COMPACT PHOTOGRAPHIC OBJECTIVE

Yasuhisa Sato, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 29, 1981, Ser. No. 335,468
Claims priority, application Japan, Jan. 13, 1981, 56-3590
Int. Cl.³ G02B 9/34, 13/18
U.S. Cl. 350—432 **2 Claims**



1. A compact photographic objective comprising:
four lenses, from front to rear,
the first lens being a positive meniscus lens convex toward the front;
the second lens being a negative lens;
the third lens being a positive lens;
the fourth lens being a negative meniscus lens concave toward the front; and
said lenses satisfying the following conditions:

$$-4 < f\beta/f < -1.3$$

$$1.1 < \beta 4 < 1.4$$

$$0.2 < D6/f < 0.3$$

$$-0.5 < \frac{R6 + R5}{R6 - R5} < 0$$

$$1.7 < N3$$

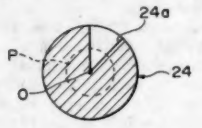
wherein f is the focal length of the entire lens system;
R5 and R6 are the radii of curvature of the first and second surfaces of the aforesaid third lens;
N3 is the refractive index of the glass from which the same lens is made up;
D6 is the air separation between the aforesaid third lens and the aforesaid fourth lens;
f4 is the focal length of the aforesaid fourth lens; and
$\beta 4$ is the image magnification of the fourth lens.

4,413,889

FOCUSING DEVICE FOR MICROSCOPES

Akio Taira, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 14, 1981, Ser. No. 283,198
Claims priority, application Japan, Jul. 17, 1980, 55-100814[U]
Int. Cl.³ G02B 7/00
U.S. Cl. 350—501 **6 Claims**



1. A focusing device for microscopes comprising a light shielding plate arranged in the position of an exit pupil of an objective lens and rotatable concentrically with the optical axis of said objective lens and having therein an aperture extending from the center to the outer edge thereof, focusing being made by observing whether the image position of an object shifts or not when said light shielding plate is rotated.

4,413,890

INSTRUMENT FOR OBJECT DETECTION OF OCULAR DISEASES

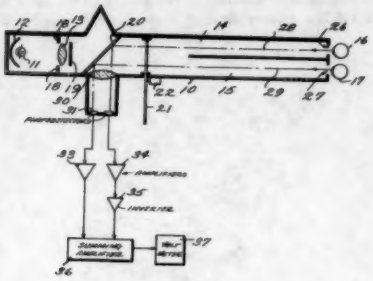
Michael Belkin, 12 Alexander Yanai St., Tel-Aviv, Israel, and David J. Lund, 60 McKeon Ct., Novato, Calif. 94947

Filed Mar. 20, 1981, Ser. No. 245,655
Int. Cl.³ A61B 3/10
U.S. Cl. 351—221 **19 Claims**

1. An apparatus for objectively detecting ocular disorders adapted to the expedient examination of uncooperative patients by simultaneously comparing the fundus reflex of each eye and indicating the deviation from normal thereof comprising:
means for collimating light into two predetermined paths for coaxial illumination of a person's right and left eye;
conditioning means acting on the collimated light in said two predetermined paths for conditioning said collimated light to effect modulation thereof;
aperture means disposed at one end of said two predetermined paths for permitting a person's eyes to be illuminated by said collimated light and for permitting retroflection of said collimated light by said person's eyes; and

means responsive to the intensity of said retroflected collimated light for detecting the relative intensities of said retroflected collimated light, wherein said detecting means includes:

means for generating an electrical signal proportional to the



detected intensity of said retroflected collimated light discretely corresponding to the right and left eye, respectively; and

means connected to said generating means for measuring the difference between said electrical signals so that ocular disorders can be objectively detected.

4,413,891

REFRACTOR OPTICAL SYSTEM

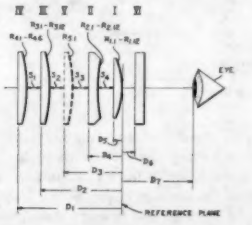
Edward B. Rybicki, Depew, N.Y., assignor to Warner Lambert Technologies, Inc., Southbridge, Mass.

Continuation-in-part of Ser. 894,455, Apr. 7, 1978, Pat. No. 4,215,919. This application Mar. 27, 1980, Ser. No. 134,374

The portion of the term of this patent subsequent to Aug. 5, 1997, has been disclaimed.

Int. Cl.³ A61B *3/02*

U.S. Cl. 351—235 **3 Claims**



1. A lens series for a refractor having a plurality of lenses positionable at each of more than two positions spaced along an optical axis and a reference plane at one of the positions which comprises, the plurality of lenses being positionable at the reference plane including a zero power lens having the same index of refraction, having the same thickness, having the same radius on one surface and the same distance to other lenses on the optical axis.

4,413,892

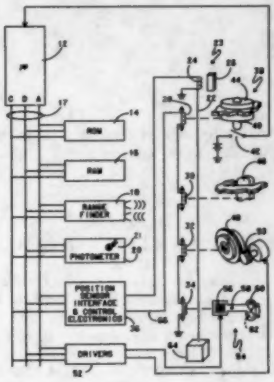
MAGNETOSTRICTIVE POSITION SENSING DEVICE AND PHOTOGRAPHIC APPARATUS INCORPORATING SUCH DEVICE

David N. Lambeth, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 2, 1982, Ser. No. 364,833

Int. Cl.³ G03B *17/00*; G01B *7/14*

U.S. Cl. 354—21 **7 Claims**



1. A photographic camera, comprising:

a camera body;

a camera member such as a shutter/aperture blade, lens, cartridge notch sensor, or shutter release button mounted for movement with respect to said camera body; and

a position sensing device for sensing the position of said camera member, said position sensing device including:

a magnetostrictive element;

sender means located at a first position with respect to said element for launching an acoustic pulse therein;

sensor means located at a second position displaced along said element from said first position for sensing the acoustic pulse in said element, said sender means and said sensor means being coupled to said camera body and said movable camera member for relative movement along said magnetostrictive element in response to movement of said camera member; and

timer means coupled to said sender means and said sensor means for measuring the elapsed time between the launch and sensing of the acoustic pulse, the elapsed time representing the relative position of said moveable member with respect to the camera body.

4,413,893

INTERCHANGEABLE LENS BARREL

Yasumasa Tomori, Sakado, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 27, 1981, Ser. No. 267,696

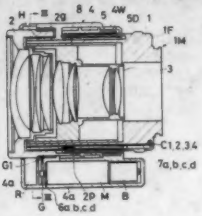
Claims priority, application Japan, Jun. 11, 1980, 55-78858

Int. Cl.³ G03B *3/10*; G02B *7/04*

U.S. Cl. 354—195 **8 Claims**

1. An interchangeable lens barrel comprising a mount securing lens barrel having a mount which can be attached to a mount of a camera body with a control device, focussing lens means rotatably supported on the mount securing lens barrel and moving in directions of the optical axis when it rotates, a driving motor, a driving mechanism connected to the driving motor for rotating the focussing lens means, a device for detecting front and rear terminal positions of the focussing lens means in the axial direction which axially moves when it ro-

tates, and means on the mount of the mount securing lens barrel opposed to the mount of the camera body for transmitting and receiving signals between the driving motor, the detecting device and the control device of the camera body.



4,413,894

INTERCHANGEABLE LENS AND CAMERA FOR USE THEREWITH

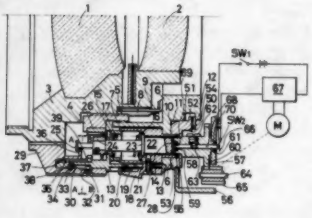
Yukio Miki, Sakai, and Takeshi Egawa, Osaka, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 25, 1982, Ser. No. 392,326

Claims priority, application Japan, Jul. 3, 1981, 56-104630; Jul. 9, 1981, 56-107360

Int. Cl.³ G03B *3/00, 17/00;* **G02B** *7/11*

U.S. Cl. 354—195 **13 Claims**



1. An interchangeable lens for mounting on a camera body equipped with a focusing device including a driving shaft for shifting at least one lens of an objective of the interchangeable lens automatically to the in-focus position, including:

a lens shifting mechanism for shifting at least one lens along the optical axis;

a driven shaft carried to be shiftable parallel to the optical axis between an engaging position and a disengaging position so that it can be either engaged with or disengaged from the driving shaft of the camera body when the interchangeable lens is mounted on the camera body; said driven shaft being also arranged so that it is disengaged from the driving shaft of the camera body when the interchangeable lens is demounted from the camera body;

a driving force transmission mechanism for transmitting the torque produced by rotation of said driven shaft to said lens shifting mechanism;

a lens shifting member for focusing working in response to manual operation;

clutch means for engaging said lens shifting member with and disengaging it from said lens shifting mechanism;

change-over means for shifting said driven shaft to said engaging position in response to setting for automatic focusing with simultaneous disengaging of said clutch means and for shifting said driven shaft to said disengaging position in response to setting for manual focusing with simultaneous engaging of said clutch means.

4,413,895

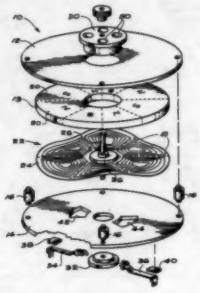
ELECTROMAGNETIC ACTUATOR HAVING A COMPLIANT ARMATURE

James K. Lee, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 360,494, Mar. 22, 1982, which is a continuation-in-part of Ser. No. 219,168, Dec. 22, 1980, Pat. No. 4,333,722. This application May 17, 1982, Ser. No. 379,372

Int. Cl.³ G03B *9/08;* **H02K** *1/22*

U.S. Cl. 354—234 **24 Claims**



1. An electromagnetic actuator of the type having means for forming a substantially planar magnetic gap and a flat armature positioned for movement in the magnetic gap, said actuator being characterized in that a portion of said armature is sufficiently compliant to contact and generally conform to the shape of said gap, and in that portions of said gap are substantially coextensive with said armature, for supporting said armature in a direction generally perpendicular to the path of said armature movement.

4,413,896

PLANE FILM CASSETTE

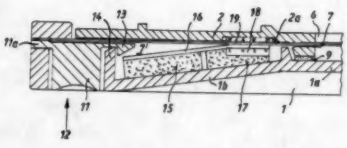
Walter Bauer, Munich, Fed. Rep. of Germany, assignor to AFGA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed May 10, 1982, Ser. No. 376,824

Claims priority, application Fed. Rep. of Germany, May 20, 1981, 3119987

Int. Cl.³ G03B *17/26*

U.S. Cl. 354—277 **20 Claims**



1. A plane film cassette for receiving at least one film, comprising a housing having two substantially flat walls, a slot provided between said walls and an illumination window provided in one of said walls; a light-protective plate insertable in a predetermined plane into said housing through said slot so as to close said window and to thereby light-tightly cover a film in the cassette; and light-tight means provided in said slot and including two light-tight elements at opposite sides of said slot, said light-tight elements being magnetically attractable toward one another and one of said light-tight elements being movable relative to the other of said light-tight elements toward said plane so that when said light-protective plate is in said slot said one light-tight elements abuts against said light-protective plate in a light-tight manner, whereas when said light-protec-

tive plate is not in said slot said light-tight elements abut against one another in a light-tight manner.

4,413,897

ELECTROSTATIC COPYING APPARATUS

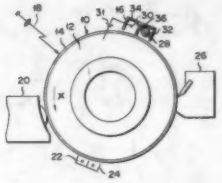
Mitsuaki Kohyama, Higashikurume, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 29, 1980, Ser. No. 202,174

Claims priority, application Japan, Oct. 31, 1979, 54-139763; Oct. 31, 1979, 54-139764

Int. Cl.³ G03G *15/02*

U.S. Cl. 355—3 CH **10 Claims**



1. An electrostatic copying apparatus comprising:

a support member being formed of an electrically conductive material;

a photosensitive layer deposited on said support member, said photosensitive layer being formed of a photoconductive material which is photosensitive to light having wavelengths falling within a first predetermined range and is not photosensitive to light having wavelengths falling within a second predetermined range; and

means for removing charges trapped in the photosensitive layer, including means for irradiating said photosensitive layer with light having a wavelength in said second range for causing the release of charges trapped in said photosensitive layer and means for generating, simultaneously with the said second range wavelength irradiation, an electric field for expelling released charges from said photosensitive layer to said support member.

4,413,898

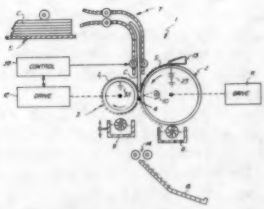
PHOTOELECTROPHORETIC DUPLEX IMAGING APPARATUS AND METHOD

Raymond E. Anne, Caledonia, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 17, 1982, Ser. No. 379,380

Int. Cl.³ G03G *15/24*

U.S. Cl. 355—3 P **4 Claims**



3. In apparatus for photoelectrophoretic imaging and which includes: (1) first and second electrodes which are movable along respective endless paths and cooperatively form an imaging nip, (2) means forming a migration inducing electrical field across said nip and (3) means for supplying photoelectrophoretic imaging suspension at said nip, the improvement comprising:

(a) means for forming a first suspension image on said second electrode, by first-image light exposure of a layer of photoelectrophoretic imaging material at said nip, and for moving said first suspension image back through said nip;

(b) means for feeding a copy sheet through said nip in timed relation with the movement of said first suspension image into said nip; and

(c) means for forming a second image on one side of said copy sheet, by means of a second-image light exposure of a layer of photoelectrophoretic imaging material at said nip, while transferring said first formed image from said second electrode to the other side of said copy sheet.

4,413,899

COPYING METHOD AND APPARATUS

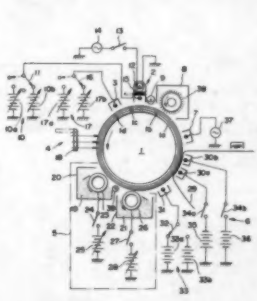
Shuichi Karasawa, Kokubunji; Fuyuhiko Matsumoto, Wako; Shuichi Tsushima, Tokyo; Masatoshi Saitou; Tsutomu Ishida, both of Machida; Kunihiko Ikeda, Kodaira; Masao Yoshikawa, Machida, and Tsutomu Sato, Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Jan. 29, 1981, Ser. No. 229,730

Claims priority, application Japan, Jan. 30, 1980, 55-8705; Jan. 31, 1980, 55-9362; Jan. 31, 1980, 55-9363; Jan. 31, 1980, 55-9364; Jan. 31, 1980, 55-9365

Int. Cl.³ G03G *15/01*

U.S. Cl. 355—4 **11 Claims**



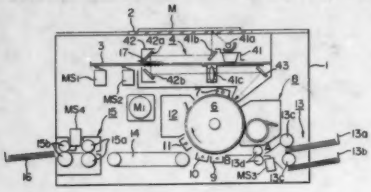
1. A two color copying apparatus comprising a single copying apparatus to produce copy sheet duplicates of an original of two colors and a white region with the copy sheet duplicates having two colors and a white region in the same areas corresponding to the areas of the original, the apparatus including a photoconductive material around which is arranged a charging unit, an exposure unit, a developing unit having two sections one of which is adapted to one color development and the other is for another color development, a transfer unit for transferring a toner image from said photoconductive material to copy sheet, and a cleaning unit, characterized in that switch means is provided for selecting a copy mode in which duplication is performed, the switch means including control means to actuate certain combinations of the aforementioned units and sections to obtain the two-color copying mode, in which both colors of the original are copied using two colors on the copy sheet, one color copying mode in which both colors of the original are copied using one color on the copying sheet or erasable mode in which one of the two colors of the original is not duplicated on the copy sheet while the other color is duplicated on the copy sheet.

4,413,900

COPYING APPARATUS WITH SCANNING POSITION CONTROL

Shunichi Abe, and Mitsuo Akiyama, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jul. 16, 1981, Ser. No. 284,118
Claims priority, application Japan, Aug. 19, 1980, 55-113642
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—8 **3 Claims**



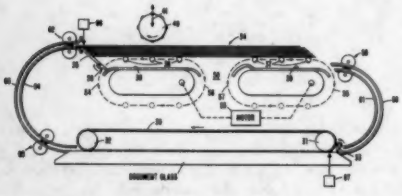
1. In a copying apparatus in which an exposure scanning means is cyclically moved forward from an end position by a first driving means and then is moved backward toward its starting position by a second driving means, and resilient shock-absorbing means catches said scanning means on its return from its end position to its starting position, the combination of control means energizing said first driving means for a predetermined time period after said scanning means has been stopped in its backward movement by said shock-absorbing means at a predetermined distance removed from the initial starting position, and further means operative after a predetermined time for energizing said second driving means to return said scanning means to its initial starting position.

4,413,901

RECIRCULATING AUTOMATIC DOCUMENT FEEDER

Ernest P. Kollar, Boulder County, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 19, 1979, Ser. No. 50,026
Int. Cl.³ G03G *15/04*; B65H *1/04, 31/00*
U.S. Cl. 355—3 SH **11 Claims**



1. A recirculating automatic document feed for use with a copier having a generally horizontal platen whereat a stationary original document is viewable for copying, comprising:

a generally horizontal platform adapted to receive a stack of original documents to be copied;

first document feed means adapted to cooperate with the top document of the stack and to feed said top document to position the document on said platen for copying;

cyclically operable stack elevating means cooperating with said platform and constructed and arranged to elevate the original document stack a distance above said platform, thereby leaving said platform unobstructed to allow placement of a document onto said platform under the elevated stack; and

second document feed means adapted to cooperate with a document on said platen and to feed such a copied document to place the copied document on said platform under the elevated stack;

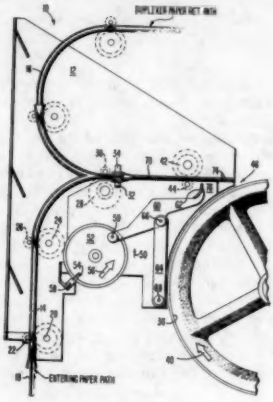
said stack elevating means thereafter lowering the stack, and subsequently reelevating the stack, including the copied document.

4,413,902

FOUR-BAR INTERPOSER MECHANISM FOR OFFSET PRINTING

Emmett B. Peter, III, Orlando, and Wilson P. Rayfield, Longwood, both of Fla., assignors to Burroughs Corp., Orlando, Fla.

Continuation-in-part of Ser. No. 138,704, Apr. 9, 1980, abandoned. This application Jan. 25, 1982, Ser. No. 342,243
Int. Cl.³ G03B *27/48, 27/50*; B65H *9/04*
U.S. Cl. 355—48 **2 Claims**



1. Apparatus for timing, synchronizing and registering individual sheet items of fixed dimension, said items being arranged to move along a prescribed pathway for precise registration with respect to printing means movable at a fixed rate comprising,

an item interposer mechanism including an irregularly shaped member, the free end of which, includes means for momentarily interrupting the leading edge of a sheet item being fed to said printing means,

an elongated link rockably, fixedly pivoted at one end with the opposite end thereof pivotally, drivingly, connected to said interposer mechanism intermediate the ends thereof enabling the end of said interposer member to move in an oblate, substantially rectiliner path,

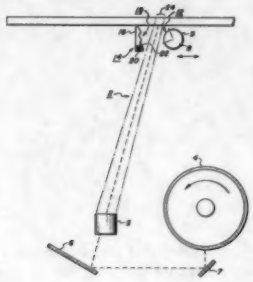
a rotatable member interconnectedly driven by said printing means and including means for periodically interrupting a light beam produced by light generating means operably associated with said rotatable member as said member is rotated, and

means interconnecting the opposite end of said interceptor linkage to said rotatable member so that upon rotation of said rotatable member said interposer linkage is moved along said oblate, substantially rectiliner path to intercept each sheet item so as to synchronize the forward movement of said sheet item with the rotative movement of said printing means effective to cause said item to locate itself along said printing means in front to back and edge to edge alignment without item overlap or interference between items.

4,413,903
DOCUMENT ILLUMINATION SYSTEM

Stephen C. Corona, Rochester, and Charles J. Urso, Jr., Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 15, 1982, Ser. No. 357,967
Int. Cl.³ G03B 27/74
U.S. Cl. 355—68 **3 Claims**



1. An illumination system for controlling the illumination of a document in an object plane, the system comprising:

at least one linear illumination source disposed adjacent to said object plane,

an elongated reflector assembly associated with the illumination source and positioned with respect to said source such that at least a portion of the emitted light from said source is directed toward, and is reflected from the facing portion of said assembly to said object plane, said reflector assembly comprising:

a light transmitting interior member,

a reflective coating on the surface of said member, said coating having a longitudinally extending aperture therethrough along the surface of the assembly directly illuminated by said illumination source whereby a portion of said direct illumination enters into said member through said aperture, and

at least one photosensor in operative association with said member to detect light entering the member through said aperture and propagating along the interior surface, said photosensor adapted to generate output illumination signals for use in controlling the light output of said illumination source.

4,413,904
ELECTRO-OPTICAL RANGE FINDER USING THREE MODULATION FREQUENCIES

Toshio Hamada, and Fumio Ohtomo, both of Tokyo, Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 4, 1981, Ser. No. 240,256
Claims priority, application Japan, Mar. 10, 1980, 55-30123
Int. Cl.³ G01C 3/08; G01S 13/08, 13/26
U.S. Cl. 356—5 **4 Claims**

1. In an electro-optical range finder including:

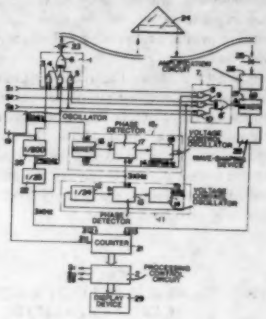
projector means for radiating a ray of light having a given modulation frequency;

light-receiving means for receiving the ray of light reflected by a reflector positioned at a measuring point and for converting it into an electric signal;

a mixer for mixing the electric signal from said light-receiving means and a reference signal; and

an arithmetic circuit for computing the distance between the measuring point and the range finder positioned at a setting point by the change in phases between the signal from said mixer and a divided signal of said modulation frequency;

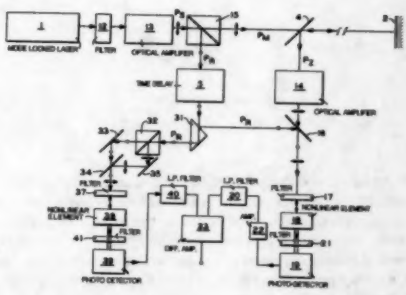
the improvement wherein said projector means further includes means for selectively radiating the rays of light with first, second and third modulation frequencies which are different from each other, said first modulation frequency having a value at least ten times higher than said second and third modulation frequencies, and said second and third modulation frequencies being approximations to each other within a maximum limit of ±20%.



4,413,905
LASER RANGE METER

Wolfgang Holzapfel, Bruchkoebel, Fed. Rep. of Germany, assignor to Honeywell Inc., Minneapolis, Minn.

Filed Aug. 1, 1979, Ser. No. 62,848
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1978, 2834660
Int. Cl.³ G01C 3/08
U.S. Cl. 356—5 **15 Claims**



1. An improved laser range meter of the type having a laser transmitter for radiating a series of pulses of known frequency toward a target, and a receiver for receiving primary measuring pulses returned from the target in response to the transmitted pulses and determining the round trip travel time of individual primary measuring pulses, the receiver including means for deriving reference pulses from the transmitted pulses, variable optical delay means for delaying the reference pulses, a measuring channel comprising a first nonlinear element which responds to the primary measuring and delayed reference pulses by emitting secondary radiation at double the known frequency, and a first radiation detector for producing an electrical signal indicative of the intensity of radiation emitted by said first nonlinear element, the range meter further having readout means connected to receive the electrical signal produced by said first radiation detector, wherein the improvement comprises:

a mode locked laser serving as the laser transmitter for

generating ultrashort high energy pulses of a pulse length which is at least two orders of magnitude shorter than the duration of secondary radiation emitted by said first nonlinear element, the intensity of said secondary radiation being representative of the time correlation of corresponding primary measuring pulses and delayed reference pulses; and

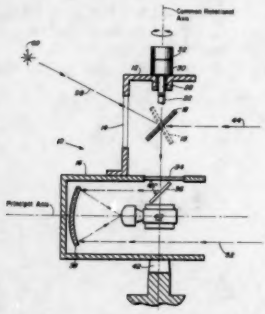
a reference channel in the receiver connected to receive delayed pulses derived from the transmitted pulses, said reference channel including a second nonlinear element for emitting radiation at double the known frequency in response to the delayed pulses and a second radiation detector for supplying an electrical signal indicative of the intensity of radiation emitted by said second nonlinear element to said readout means.

4,413,906

PASSIVE OPTICAL RANGEFINDER/SEXTANT HAVING SEARCH CAPABILITY

Sidney Feldman, Silver Spring, Md., and George G. Barton, Jr., Harker's Island, N.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 25, 1981, Ser. No. 277,376
Int. Cl.[3] G01B 11/26; G01C 1/00
U.S. Cl. 356—141 **4 Claims**



1. An improved rangefinder/sextant having a search capability and of the type having an optics housing including an optics housing yoke operatively attached to the bottom of said optics housing for moving thereof azimuthally and elevationally, a spherical mirror mounted towards the rear of said optics housing, an imaging camera disposed in said optics housing towards the front thereof on the principal optical axis of said spherical mirror, index mirrors and horizon mirrors symmetrically arranged in pairs on opposite sides of said optics housing and on opposite sides of the principal axis of said spherical mirror, and control means arranged such that rangefinder and sextant measurements can be made, wherein the improvement comprises:

a search mirror device operatively attached to the top of said optics housing and configured for continuous azimuthal and elevational motion independent of the aximuthal and elevational motion of said optics housing yoke to provide the search capability; and

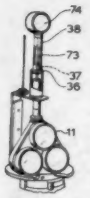
a deflection mirror fixedly connected to said optics housing at an angle of 45 degrees as referred to the principal axis of said spherical mirror and mounted above said imaging camera on a rotational axis common to said search mirror device, said deflection mirror and said optics housing yoke such that light rays deflected from said search mirror device are directed via said spherical mirror to said imaging camera.

4,413,907

REMOTE CONTROL SURVEYING

Vern E. Lane, Cheyenne, Wyo., assignor to Robert F. Deike, Cheyenne, Wyo.

Filed Nov. 7, 1980, Ser. No. 204,813
Int. Cl.[3] G01B 11/26; G01C 3/08
U.S. Cl. 356—141 **9 Claims**



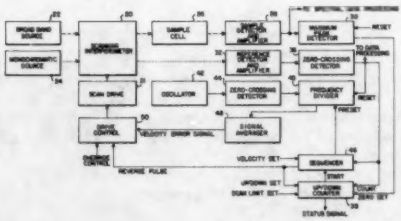
1. The method of surveying which comprises selecting a pair of spaced base points, determining the distance between said base points, positioning remote control rotatable reflector units over said base points, said reflector units each having a stroboscopic light co-rotatable and co-directional therewith, establishing an electronic distance measurement survey station visible to said base points and spaced therefrom, selectively rotating said reflector units from said survey station, observing the brightness of each of said stroboscopic lights, ceasing rotating said reflector units when the observed brightness of each of said stroboscopic lights is at a maximum, determining the distances between each base point and the survey station, and calculating the location of the survey station relative to said base points.

4,413,908

SCANNING INTERFEROMETER CONTROL SYSTEMS

David E. Abrams, Winchester; Raul Curbelo, Lexington, and R. Brough Turner, Newton Corner, all of Mass., assignors to Bio-Rad Laboratories, Inc., Richmond, Calif.

Filed Mar. 5, 1982, Ser. No. 354,934
Int. Cl.[3] G01B 9/02
U.S. Cl. 356—346 **2 Claims**



1. A system for controlling cyclic excursions of optical path length in a scanning interferometer including means for providing a beam of substantially monochromatic radiation traversing said interferometer, which beam is cyclically modulated by said excursions, said system comprising, in combination:

means for detecting said radiation and for generating a signal responsively to modulation of said beam;

means for detecting predetermined like conditions of said signal in substantially each cycle of said modulation and for generating a pulse for each said condition detected;

comparison means for comparing time intervals between successive said pulses with a temporal period selected from a pre-established ordered sequence of temporal peri-

ods, said comparison means being capable of providing an error signal dependent on the comparison of said intervals and said period by said comparison means;

scan drive means for controlling the velocity of said excursions responsively to said error signal, said scan drive means further including means for reversing the direction of motion of an excursion responsively to a command signal;

means for counting said pulses, said means for counting including means for reversing the direction of counting responsively to a trigger signal; and

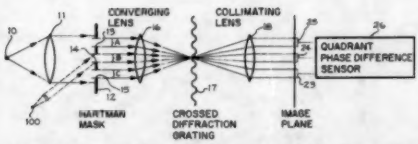
sequencing means responsive to a predetermined count in said means for counting, so as to sequentially alter said temporal period in accordance with said ordered sequence of temporal periods, said sequencing means further providing said command signal and said trigger signal at predetermined periods in said sequence, whereby said excursions are controlled by detections of said modulation of said beam so as to reverse the direction of excursion motion within less than a half of cycle of said modulation.

4,413,909

WAVEFRONT TILT MEASURING APPARATUS

Richard H. Pohle, Monta Vista, Calif., assignor to Lockheed Missiles & Space Co., Inc., Sunnyvale, Calif.

Filed Jun. 1, 1981, Ser. No. 268,855
Int. Cl.³ G01B *9/02*
U.S. Cl. 356—354 **30 Claims**



1. A method for making tilt measurements of a first optical wavefront relative to a second optical wavefront, said first wavefront being defined by a first aperture and said second wavefront being defined by a second aperture, said method comprising the steps of:

(a) causing images of said first aperture formed by different orders of diffraction components of said first wavefront to interfere with each other, thereby producing first wavefront interference patterns;

(b) causing images of said second aperture formed by said different orders of diffraction components of said second wavefront to interfere with each other, thereby producing second wavefront interference patterns;

(c) causing periodic temporal fluctuations in intensity of said first wavefront interference patterns and of said second wavefront interference patterns; and

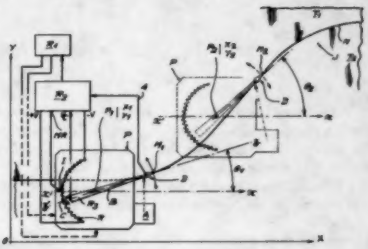
(d) determining a phase relationship between the intensity fluctuations of one of said first wavefront interference patterns and the intensity fluctuations of a corresponding one of said second wavefront interference patterns, said phase relationship being a quantitative measure of tilt of said first wavefront relative to said second wavefront.

4,413,910

SYSTEM FOR DETECTING AND LOCATING SURFACE DISCONTINUITY BY A LIGHT BEAM

Jean Cornu, Nantes; Jean-Marie Detriche, Chambourcy; Bernard Tiret, Verdun; Gerard Jorge, Lunel; Richard Galera, Meylan; Dominique Biava, Clamart, and Paul Marchal, Gif-sur-Yvette, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 13, 1981, Ser. No. 234,361
Claims priority, application France, Feb. 12, 1980, 80 03068
Int. Cl.³ G01B *11/24*
U.S. Cl. 356—377 **9 Claims**



1. System for detecting and locating surface discontinuity by a light beam, comprising:

a detector comprising means for emitting a convergent incident beam of monochromatic light, in the direction of the discontinuity, means for receiving the light reflected on the surface and an optoelectronic transducer for the reflected light, associated with the receiving means;

means for displacing the detector so that the incident beam transversely scans the discontinuity and the vicinity thereof;

a carrier adapted to move the means for displacing the detector, along the discontinuity, this carrier being associated with means for locating its position with respect to a fixed system of coordinates;

locating means, connected to the receiving means of the detector, for locating the successive angular positions of this detector, with respect to a reference direction associated with the carrier, when this carrier occupies different positions along the discontinuity and when the incident beam passes over the discontinuity;

wherein the means for locating each angular position of the detector comprise means for determining the angular position of the detector with respect to said reference direction, each time the incident beam passes through a point located on the discontinuity;

wherein the means for determining the angular position of the detector each time the incident beam passes through a said point located on the discontinuity, comprise means for recording each pulse coming from the optoelectronic transducer and means for recording, for each of these pulses, the value of the angle between a detector position locating line and said reference direction, this detector position locating line passing through a determined point of the carrier and through a point of the detector, characteristic of the position of the detector;

wherein the means for recording each pulse comprise a circuit for shaping these pulses;

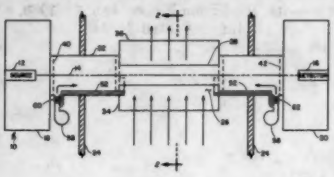
wherein the shaping circuit comprises a high gain amplifier, associated with an assembly for filtering the background noise accompanying these pulses; and

wherein the filtering assembly comprises at least one filter associated with means for comparing the output signal from this filter with a floating reference D.C. voltage corresponding to the means level of the signal leaving the filter.

4,413,911
GAS ANALYZER WITH FLUID CURTAIN

Richard G. Rice, Cupertino; Mathew G. Boissevain, Los Altos Hills, and Robert R. Dubin, San Jose, all of Calif., assignors to Measurex Corporation, Cupertino, Calif.

Filed Apr. 24, 1981, Ser. No. 257,063
Int. Cl.³ G02B *7/00*
U.S. Cl. 356—438 **8 Claims**

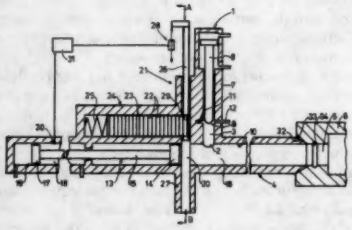


1. Apparatus for analyzing a first gas stream comprising:
(a) a source capable of emitting a beam of radiation;
(b) a detector located so that the beam passes through the first gas stream and impinges the detector;
(c) housing means enclosing at least part of the beam;
(d) means for filling the housing means with a second gas; and
(e) nozzle means coupled to said housing means for providing a curtain of fluid substantially between the second gas in said housing means and the first gas stream to substantially prevent the first gas stream from mixing with the second gas inside said housing means.

4,413,912
APPARATUS FOR THE PRODUCTION OF A REACTION MIXTURE

Frank Redmer, Leverkusen, and Kurt Krippl, Monheim, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 30, 1982, Ser. No. 373,587
Claims priority, application Fed. Rep. of Germany, May 16, 1981, 3119662
Int. Cl.³ B29B *1/06*
U.S. Cl. 366—69 **8 Claims**

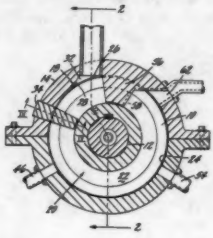


1. An apparatus for the production of a solid-forming or a foam-forming reaction mixture from at least two flowable components, the apparatus comprising a mixing head with a mixing chamber having an outlet opening, a filling tube, an ejection piston which is designed as a piston head having a forward and a rear position and a piston rod with a smaller diameter than that of the piston head and an introduction slit for the introduction of cleaning platelets, which platelets correspond to the size and shape of the filling tube and which are advanced through the filling tube by the ejection piston to clean residual mixture from the filling tube, wherein at the outlet opening of the mixing chamber is connected at an angle said filling tube in which the ejection piston is positioned, said introduction slit being provided in the filling tube between the rear position of the ejection piston and the outlet opening of the mixing chamber, and wherein a delivery device for cleaning platelets is associated with the introduction slit.

4,413,913
METHOD FOR PROCESSING PLASTIC AND POLYMERIC MATERIALS

Peter Hold, Milford, Conn., and Zehev Tadmor, Teaneck, N.J., assignors to USM Corporation, Farmington, Conn.

Division of Ser. No. 190,465, Sep. 24, 1980, Pat. No. 4,329,065, which is a continuation of Ser. No. 971,331, Dec. 20, 1978, abandoned, which is a continuation-in-part of Ser. No. 849,184, Nov. 7, 1977, abandoned. This application Mar. 24, 1982, Ser. No. 361,397
Int. Cl.³ B01F *5/12, 7/10;* B29B *1/06, 3/02*
U.S. Cl. 366—75 **10 Claims**



1. A method for processing liquid plastic or polymeric materials including the steps of:
a. providing a processing zone defined by an annular processing passage comprising a channel having opposed rotatable walls providing a polymer processing surface area for the zone, a coaxial stationary enclosure surface cooperatively arranged with the channel to retain material in the passage, a feed point and a discharge point associated with the stationary surface, a liquid material blocking and collecting end wall surface providing member positioned adjacent the discharge point which is spaced apart from the feed point a major portion of the circumferential distance about the passage, a blocking and spreader surface providing member spaced apart from the end wall surface providing member by a major portion of the circumferential distance about the passage and port means communicating with a selected portion of the passage between the blocking and spreader surface and the end wall surface;
b. rotating the opposed channel walls;
c. introducing the liquid material at the feed point;
d. blocking the advance of liquid material in the central portion of the channel at the blocking and spreader surface;
e. spreading blocked material on the opposed rotating walls as thin layers so that the spread thin layers can be carried past the blocking and spreader surface providing member toward the end wall surface and provide a free central space in advance of the blocking and spreader surface providing member in the direction of rotation of the walls;
f. adding material to or removing material from the thin layers through said port means;
g. blocking advance of said thin layers and collecting blocked thin layer material at said blocking and collecting end wall surface for controlled processing and/or discharge from said processing zone; and,
h. discharging said material from said processing zone to another processing zone as defined in step a for further processing at least according to steps b, c, d, e, f and g.

4,413,914

RECOVERY OF HEAVY HYDROCARBONS FROM OIL SLUDGE

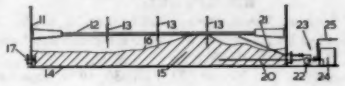
Alistair D. McBride, Wishaw, Scotland, and Ian S. Ripley, Cleveland, England, assignors to Emultec Limited, Cleveland, England

Division of Ser. No. 228,274, Jan. 19, 1981, Pat. No. 4,364,776. This application Sep. 28, 1982, Ser. No. 426,149

Claims priority, application United Kingdom, Jan. 19, 1980, 8001862

Int. Cl.³ B01F 3/12

U.S. Cl. 366—137 2 Claims



1. Apparatus for effecting emulsification of a hydrocarbonaceous sludge body in a container, comprising a tank for storage of dispersant chemical, a pump having its inlet connected to a pipe for drawing off emulsified fluid from the surface of the sludge body in the container, a plurality of narrow bore lances for penetrating into the sludge body in the container and each lance connected to the pump outlet, means providing a supply of water, and valve means interconnecting the storage tank and the water supply means with the pump inlet whereby dispersant chemical and/or water can be pumped under pressure along the lances and drawn off emulsified fluid recirculated to the sludge body under pressure through said lances, wherein the draw-off pipe and each lance is a fluid-tight fit in a pertaining glanded nozzle, the nozzles being mounted on a carrier plate which is releasably securable over an opening in said container, and the draw-off pipe includes an elbow which is securable in the pertaining glanded nozzle in any one of a number of orientations so that the end of said pipe within the container can be selectively relocated as required to follow the changing level of the emulsified fluid in the container.

4,413,915

WATCH HAVING AN ANALOG DISPLAY AND A DIGITAL DISPLAY

Rene Besson, Neuchatel, Switzerland, assignor to ETA S.A. Fabriques d'Ebauches ETA 13, Switzerland

Filed Dec. 11, 1981, Ser. No. 329,652

Claims priority, application Switzerland, Dec. 16, 1980, 9258/80

Int. Cl.³ G04B 25/00; G04C 19/00

U.S. Cl. 368—71 13 Claims

1. A watch comprising a casing, movable members for displaying time analogically, dial means for said movable members, and digital display means surrounded by said dial means and responding to a first external action by taking substantially the same colour as that of said dial means and also responding to a second external action by taking a colour different from that of said dial means.

4,413,916

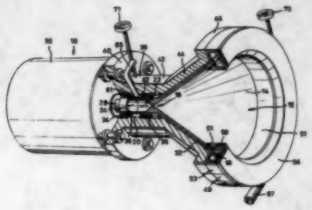
POWER METER FOR LASERS

Herb J. J. Seguin, Edmonton, Canada, assignor to Majestic Contractors Limited, Edmonton, Canada

Filed Mar. 23, 1982, Ser. No. 360,836

Int. Cl.³ G01J 5/02; G01K 17/00

U.S. Cl. 374—32 14 Claims



1. Apparatus for determining the power output of a laser for wavelengths which are substantially fully absorbed by water, comprising:

a rotary member defining a surface of revolution which widens away from an opening to a free edge, the opening being located substantially at the axis of said surface,

first means for rotating said member about said axis,

second means for bringing water to said surface through said opening,

third means for collecting water at said free edge,

fourth means for measuring the throughput of water through the apparatus,

and fifth means for measuring the water temperature differential arising due to absorbable radiation falling upon the water as it runs over saidsurface.

4,413,917

RESISTANCE MEASURING SYSTEM

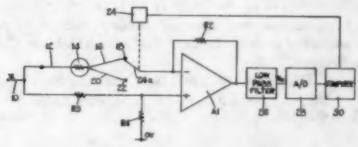
Neil A. Cooper, Birmingham, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Jun. 11, 1981, Ser. No. 272,743

Claims priority, application United Kingdom, Jun. 13, 1980, 8019475

Int. Cl.³ G01K 7/20

U.S. Cl. 374—173 5 Claims



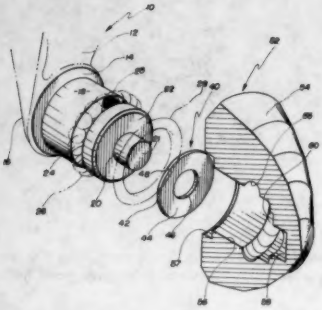
1. A resistance measuring system comprising a sensor the resistance of which varies, a first lead connected to one end of the sensor, a second lead connected to the other end of the sensor, a third lead of different resistance to the second lead connected to said other end, a circuit for measuring the resistance of the sensor, and switch means having a first state in which the sensor is connected to the measuring circuit through the first and second leads and a second state in which the sensor is connected to the measuring circuit through the first and third leads, the measuring circuit including means for producing a first voltage corresponding to the combined resistance of the sensor and the first and second leads when the switch means are in said first state and a second voltage corresponding to the combined resistance of the sensor and the first and third leads when the switch means are in the second state.

4,413,918

THRUST BEARING FOR ROCK BITS

Robert D. Thomas, Arlington, Tex., assignor to Smith International, Inc., Newport Beach, Calif.

Filed May 19, 1982, Ser. No. 379,692
Int. Cl.³ F16C *33/00, 17/04*
U.S. Cl. 384—95 **3 Claims**



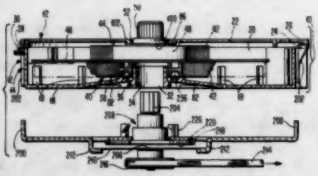
1. A rotary rock bit comprising:
a bit body having an upper end connectable to a drillstring;
at least one bearing journal extending from an opposite end of said body, said bearing journal defining at least one radially disposed bearing surface thereby;
a cutter cone rotatably positioned on said journal, said cutter cone defining at least one radially disposed bearing surface, said cone bearing surface being so configured to mate with said at least one radially disposed bearing surface formed by said bearing journal; and
at least one intermediate radially disposed thrust bearing positioned between said radially disposed bearing surfaces formed by said journal and said cone, said intermediate bearing is retained between said journal and bearing by intermediate bearing retention means, an outside peripheral edge formed by said intermediate radially disposed thrust bearing is noncircular, said noncircular bearing registers with a matching noncircular cavity formed in said cone, said noncircular cavity formed in said cone prevents rotation of said intermediate bearing when said cone is rotated on said journal.

4,413,919

RIBBON LOADING SYSTEM FOR PRINTERS

Steven L. Applegate, and James J. Molloy, both of Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 30, 1981, Ser. No. 315,591
Int. Cl.³ B41J *32/00, 33/12, 35/08, 33/52*
U.S. Cl. 400—208 **18 Claims**



1. A cartridge for printer ribbon comprising:
first and second ribbon reels arranged to have a common rotational axis;
a container for said reels having a cover portion and a base portion including a generally flat floor that is opposite said cover portion, and a sidewall extending to receive said cover section, said first reel being arranged toward said floor and said second reel being arranged toward said cover;
resilient means, arranged to project from said floor, for engaging said first reel and for urging said first reel toward said second reel and said cover; and
means defining at least one access aperture in said base portion to permit interaction with said resilient means from outside said container.

4,413,920

PRINTING RIBBON CARTRIDGE WITH FLEXIBLE RIBBON GUIDES

Dan W. Matthias, Downingtown, and Collier M. Miller, Rosemont, both of Pa., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 98,773, Nov. 30, 1979, abandoned, which is a continuation of Ser. No. 833,257, Sep. 14, 1977, abandoned. This application Oct. 9, 1981, Ser. No. 310,158
Int. Cl.³ B41J *35/04*
U.S. Cl. 400—248 **28 Claims**

1. A printer comprising means for supporting a print receiving medium, laterally movable character printing means juxtaposed to said supporting means for establishing a laterally movable print point, a ribbon comprising a printing medium for advancing past said movable print point in printing relationship with said print receiving medium and said character printing means, stationary ribbon storage means for storing said ribbon, means for moving said ribbon between said print point and said storage means, the improvement comprising means for maintaining a substantially constant path length from said ribbon storage means to said print point including flexible leader means and flexible cover means extending across said leader means so as to form a channel for said ribbon to move therethrough for supporting said ribbon, said means for maintaining a substantially constant path length maintaining curvature in a single direction as said movable print point moves, said flexible cover means being slidable with respect to said flexible leader means.

4,413,921

COSMETIC PENCIL HAVING A SHARPENABLE POLYETHYLENE CASING

Eustace Fotiu, Mahwah, N.J.; Marlene Tietjen, New York; Tibor Goldner, Fresh Meadows, both of N.Y., and Philip Rosenblum, West Orange, N.J., assignors to Revlon, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 939,887, Sep. 5, 1978, abandoned. This application Jul. 10, 1980, Ser. No. 168,239
Int. Cl.³ A45D *40/00, 40/20*
U.S. Cl. 401—96 **23 Claims**

1. A cosmetic pencil capable of being sharpened in a conventional pencil sharpener, comprising a casing and a cosmetic composition core, wherein:
(a) said casing:
(i) comprises a homogeneous blend of materials, including major proportion of polyethylene whose density is in the range of between about 0.88 g/cc and 0.99 g/cc;
(ii) is made under conditions which are substantially free

of blowing agents for said polyethylene, thereby providing a non-porous casing;

(iii) is inert to ingredients in said cosmetic composition;

(iv) has a hardness in the range of between about 35–70 by the Shore Durometer according to the ASTM D-2240 method enabling said casing to be smoothly and evenly sharpened in a conventional pencil sharpener without significant resistance to the cutting edge of said sharpener;

(v) has a softening point above 60° C. enabling said casing to rigidly retain its shape when in contact with hot cosmetic compositions; and,

(vi) has a wall thickness sufficient to render said casing relatively inflexible at temperatures below 60° C.; and,

(b) said cosmetic core composition comprises a solid cosmetic product in contact with said casing.

4,413,922

BRANCH-OFF SEAL

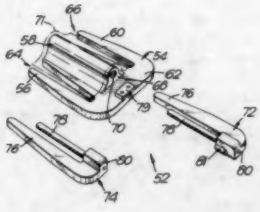
Jean M. E. Nolf, Hamme-Mille, Belgium, assignor to N.V. Raychem S.A., Kessel-Lo, Belgium

Filed May 21, 1981, Ser. No. 265,733

Claims priority, application United Kingdom, May 22, 1980, 8016951

Int. Cl.³ F16B *2/12*

U.S. Cl. 403—341 **16 Claims**



1. A clamping member for use in forming a branch-off seal between a recoverable sleeve and a plurality of substrates extending from an end thereof, the clamping member comprising:

at least two interengageable parts that extend generally parallel to each other, the parts being slidably interengageable and, when interengaged, providing at least five legs extending generally parallel to each other from a head of the member,

the legs defining four generally parallel channels for receiving respective circumferentially-spaced portions of the sleeve with at least one of said legs extending into the sleeve to form therein at least four ducts for said substrates.

4,413,923

SELF-CLEANING REFLECTIVE ROAD MARKER

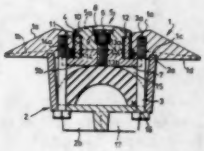
Bernard Wright, Burnside Cottage, Dalguise, Dunkeld, Perth, Scotland

Filed May 11, 1981, Ser. No. 262,795

Claims priority, application United Kingdom, May 13, 1980, 8015815

Int. Cl.³ E01F *9/00*

U.S. Cl. 404—11 **14 Claims**



1. A self-cleaning reflective road marker comprising:

a housing having a generally cylindrical portion for insertion into a road surface and including a flanged portion, the flanged portion being connected to the generally cylindrical portion by connectors;

a stud comprising first and second stud portions connected together to secure a reflector on the stud wherein the second stud portion is generally circular and includes a plurality of equally spaced cut-outs for engaging said connectors whereby when the stud moves between said first and said second position, the movement of the stud is guided by the co-operation of the cut-outs and the connectors;

resilient means biasing the stud upwardly in the housing; and

reflector cleaning means located in the housing in a position to wipe the reflector when the latter is depressed against the bias of the resilient means;

the first and second stud portions being connected together by connector means engageable from above the road marker only to effect disconnection of said stud portions;

the first stud portion upon such disconnection being removable upwardly from the road marker, whereby the reflector and the cleaning means may be removed and replaced without removal of the housing from the road surface.

4,413,924

BLOCKS FOR CONSTRUCTING A BREAKWATER

Takeshi Ijima, Fukuoka, Japan, assignor to Iida Kensetsu Co., Ltd., Fukuoka, Japan

Filed Jul. 20, 1981, Ser. No. 284,750

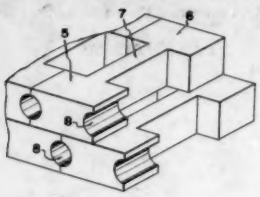
Claims priority, application Japan, Nov. 21, 1980, 55-164883

Int. Cl.³ E02B *3/06*; E04B *1/02*; E04C *1/08*

U.S. Cl. 405—31 **6 Claims**

1. Blocks for constructing a breakwater, each of said blocks having a front wall and a rear wall, said rear wall being in parallel and spaced-apart relationship relative to said front wall, at least one partition wall disposed perpendicular to said front and rear walls and integrally connecting said front and rear walls to form at least a half portion of a vertical open-ended chamber between said front and rear walls, at least a half portion of a horizontal hole formed in said front wall, each of

said blocks having at least a left and a right vertical open-ended hole formed in one of said front or rear walls, said blocks being disposed in generally horizontal rows with abutting joints with at least one row overlying another row and with the center-line of a block in said one row being generally vertically aligned with the abutting joint of two blocks in said other row, said blocks in said one row having their left and right open-ended holes each spaced from the respective block center-line a first distance, said blocks in said other row having their open-ended holes each spaced from the respective block center-line a second distance, said first distance being different from said second distance such that the left hole in one block in said one row is generally vertically aligned with the right



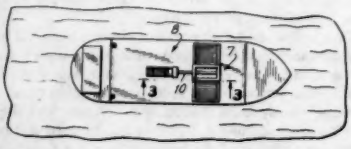
hole in a second block in said other row and the right hole in said one block in said one row is generally vertically aligned with the left hole in a third block in said other row in which said second and third blocks generally abut one another along an abutting plane which generally bisects said first block, whereby a plurality of rows of blocks may be stacked on one another to form said breakwater with the vertical abutting joints between the blocks in said one row being horizontally displaced relative to the vertical abutting joints of said blocks in said other row and with said vertical open-ended holes in overlying blocks being vertically aligned and thereby adapted to receive a material for providing vertical structural support to said breakwater.

4,413,925

INDEPENDENTLY BALANCED SUPPORT PLATES

John P. Latimer, Newport News, Va., assignor to Deepsea Ventures, Inc., Gloucester Point, Va.

Filed Dec. 28, 1979, Ser. No. 108,121
Int. Cl.³ B63B *35/44*; E02D *21/00*
U.S. Cl. 405—195 **11 Claims**



1. Support means for supporting a relatively heavy weight having a horizontally extending, downwardly facing surface, the means comprising:

(a) a primary support platform;

(b) a plurality of load support members arranged around a central axis and each having an upwardly facing supporting surface:

(c) balancing and connecting means pivotably connecting the load support members to the primary support platform about two transverse, horizontal axes, each load support member being independently pivotally supported about at least one such horizontal axis; and

(d) drive means for reciprocally moving the load support member relative to the central axis, towards and away from a load supporting position;

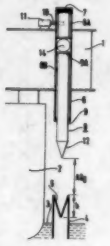
whereby the weight is substantially proportionately supported by the support surfaces of the plurality of load support members when the load support members are balanced about the transverse axes, such that net transverse stress is minimized on the weight being supported.

4,413,926

SYSTEM AND METHOD FOR POSITIONING AN OFF-SHORE PLATFORM ON A SUPPORT

Jean-Louis Ninet, Nantes, France, assignor to Societe Anonyme dite: Ateliers et Chantiers de Bretagne-ACB, Nantes, France

Filed Aug. 6, 1981, Ser. No. 290,537
Claims priority, application France, May 15, 1981, 81 09708
Int. Cl.³ E02D *25/00*
U.S. Cl. 405—204 **6 Claims**



1. System for positioning a barge-mounted off-shore platform on a support structure fixed to the sea bed, said fixed support structure including a plurality of upstanding piles with at least two of said piles having platform leg-receiving guide means at their upper ends, said platform including a plurality of legs for fixing to corresponding ones of said piles, at least two of said legs being hollow, plungers slideably mounted within said hollow legs for co-operating engagement with said platform leg-receiving guide means, a releasable fastening holding the plunger fixed at a raised position within said hollow leg for releasing said plunger on command for gravity drop into engagement with said platform leg-receiving guide means, means for effecting release simultaneously on a common command of the releasable fastenings of at least two of the plungers, abutment means fixedly mounted to said legs above said plungers for limiting upward movement of said plunger within said hollow leg, and wherein each plunger is constituted by upper and lower, axially separated rigid members freely slidable within said hollow leg with a block of shock-absorbing material sandwiched in between them, and wherein said lower rigid member terminates in a lower end configured to said platform leg-receiving guide means; whereby, upon release of said releasable fastening, said upper and lower rigid members with the block of shock-absorbing material sandwiched in between them move downwardly within said hollow leg until said lower rigid members abut said piles with the lower ends received within said guide means, and wherein as said platform continues to descend, said rigid members and said block of shock-absorbing material move upwardly within said hollow legs, until said upper rigid member abuts said abutment means, whereupon said lower rigid members continue to move relative to the hollow legs to the extent where said block of shock-absorbing material sandwiched in between said upper and lower rigid members, is fully compressed.

4,413,927

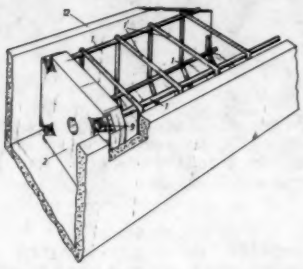
ELEMENT FOR USE IN CONCRETE PILE CASTING TO ALIGN COUPLING MEMBERS ON END FITTINGS

Frank O. Silvander, Richertsgatan 12, S-412 60 Göteborg, Sweden

Filed May 20, 1982, Ser. No. 380,241
Int. Cl.³ E02D *5/30, 5/34*
U.S. Cl. 405—252 **2 Claims**

1. An element for use in concrete pile casting to align cou-

pling members on end fittings during the pile casting operation, comprising key grooves formed in said end fittings, locking keys designed, when two concrete pile sections are to be joined together in end-to-end position, to engage in said key grooves to interconnect the end fitting at one of the ends of one of said concrete pile sections with a matching end fitting arranged at the opposed end of the other one of said two concrete pile sections, a through-passage at the bottom of each one of said key grooves, a recessed seat in said through-passage, said seat arranged to accommodate therein one of said coupling members on said coupling member resting freely in said seat, one such coupling member being coupled to each one of the reinforcement iron rods extending lengthwise through said concrete pile sections, the improvement comprising



a presser means, a support member placed in one of said key grooves formed in said end fittings, said presser means extending through said support member, said support member arranged to be pressed against the free end of said coupling member while the side faces of the associated one of said key grooves serve as back-up faces to said support member.

4,413,928

REINFORCING AND CONFINING EARTH FORMATION

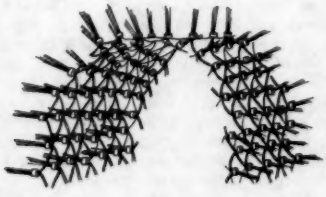
Michael C. Tucker, Halliburton Services, Athens Tower B, Suite 506, 610 Athens, Greece

Filed Nov. 17, 1980, Ser. No. 207,554

Claims priority, application South Africa, Nov. 23, 1979, 79/6363

Int. Cl.³ E21D *20/02*

U.S. Cl. 405—260 **17 Claims**



1. A method of reinforcing and confining an earth formation by means of a plurality of restraining units, the units having retaining limbs for insertion into prepared holes in the formation and transverse portions for lying substantially against the formation, and means associated with said retaining limbs for inhibiting removal thereof from the holes, which method comprises forming an array of said holes in the formation with the spacing between said holes being substantially equal to the lengths of said transverse portions, inserting the retaining limbs into said holes with a plurality of said limbs in a majority of said holes, disposing the transverse portions of the units in contact with the surface of the formation, each of the transverse portions extending to different other holes to form a mesh-like arrangement anchored at least partially by the retaining limbs.

4,413,929

ROCK BOLT

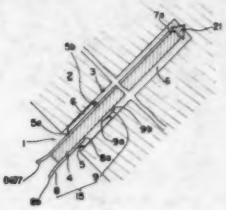
Tomio Kigawa, Matsubara, and Kouetsu Fukui, Kawasaki, both of Japan, assignors to Kubota, Ltd., Osaka, Japan

Continuation of Ser. No. 217,145, Dec. 16, 1980, abandoned. This application Mar. 1, 1983, Ser. No. 471,136

Claims priority, application Japan, Dec. 18, 1979, 54-165347

Int. Cl.³ E02D *20/02*

U.S. Cl. 405—260 **10 Claims**



1. A rock bolt for insertion into a hole comprising:

a rock bolt body;

inflatable bag means surrounding the outer periphery of said body adjacent one end thereof;

retainer means for securely fixing said bag means to said body;

injection tube means extending from adjacent said one end of said body through said bag means for communicating with the interior of said bag means for feeding packing material into said bag means to inflate said bag means and also for communicating with the space defined between the walls of said hole, said bolt body, and said bag means for feeding said material into said space after said bag means is inflated, said tube means comprising a tube having a cut-out portion in said bag means; and

exhaust tube means extending through said bag means from adjacent said one end of exhausting air from said space as said material is fed into said space.

4,413,930

METHOD AND APPARATUS FOR COMBINING RESIN BONDING AND MECHANICAL ANCHORING OF A BOLT IN A ROCK FORMATION

Frank Calandra, Jr., Johnstown, Pa., assignor to Jennmar Corporation, Cresson, Pa.

Continuation-in-part of Ser. No. 209,134, Nov. 21, 1980. This application Feb. 27, 1981, Ser. No. 238,760

Int. Cl.³ E21D *20/02*

U.S. Cl. 405—261 **15 Claims**

1. Apparatus for supporting a rock formation comprising,

an elongated rod positioned in a bore hole in the rock formation,

said rod having a threaded portion with a tapered end portion extending from said threaded portion,

a tensioning element having an internally threaded bore,

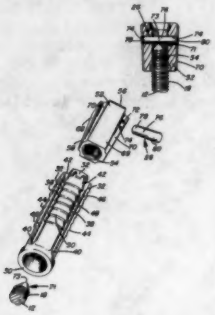
said rod threaded portion engaging said tensioning element internally threaded bore, pl stop means extending through said tensioning element for preventing relative rotation between said rod and said tensioning element upon application of a predetermined torque in a preselected direction to said rod ro rotate together said tensioning element, stop means and rod,

said rod tapered end portion abutting said stop means to obstruct movement of said rod tapered end portion be-

yond a preselected point in said tensioning element internally threaded bore,

anchor means for anchoring said rod in the bore hole,

said stop means being carried by said tensioning element in a position removed from contact with said anchor means, and



said stop means being displaced by said rod tapered end portion from a position preventing relative rotation between said rod and said tensioning element when said torque continuously applied to said rod in said preselected direction exceeds said predetermined torque to place said rod under tension in the bore hole.

4,413,931

METHOD FOR TREATING SUBTERRANEAN FORMATIONS

Roderick A. McDonald, Bothell, Wash., assignor to Univar Corporation, Seattle, Wash.

Filed Feb. 2, 1981, Ser. No. 230,618

Int. Cl.³ E02D *3/12*; C09K *17/00*

U.S. Cl. 405—264 **9 Claims**

1. A method for treating a subterranean formation comprising the steps of:

placing in or adjacent said formation a particulate material coated with a two-step, curable, novolac resin comprising the reaction product of an aldehyde with a phenolic compound, and thereafter causing said resin to cure in said formation and thereby bonding said particulate material together, said resin havng an insolubility paramteter (p) greater than about 1.0.

4,413,932

PNEUMATIC CONVEYORS FOR FLOW OF GAS-BORNE PARTICULATE MATERIAL

Joseph Kobak, Wallsend, Australia, assignor to The Broken Hill Proprietary Company Limited, Melbourne, Australia

Continuation-in-part of Ser. No. 221,790, Dec. 31, 1980, abandoned, which is a continuation-in-part of Ser. No. 58,262, Jul. 17, 1979, abandoned. This application Feb. 17, 1982, Ser. No. 349,197

Claims priority, application Australia, Aug. 8, 1978, PD5419

Int. Cl.³ B65G *53/16*

U.S. Cl. 406—138 **18 Claims**

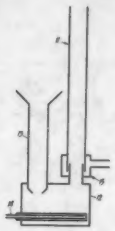
1. A method of transporting particulate material, said method comprising:

(a) entraining said particulate material in a lean phase with a main flow of gas;

(b) delivering said main flow of gas along an elongate duct at a low pressure via a duct inlet of said duct;

(c) introducing an auxiliary gas stream at a low pressure into said elongate duct adjacent to said duct inlet to define a low pressure non-boosting annular stream of auxiliary gas directed along at least part of a periphery of said duct;

said particulate material being transported along said duct entrained in lean phase by said main flow of gas;



said annular stream of auxiliary gas at least substantially preventing collection and recirculation of particulate material without boosting blow of said particulate material along said elongate duct.

4,413,933

PNEUMATIC SUCTION DEVICES

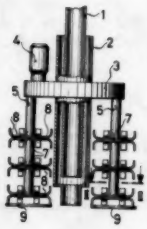
Theodor Hesse; Helmut Rieke, and Johannes Kleine-König, all of Melle, Fed. Rep. of Germany, assignors to Engelbrecht & Lemmerbrock GmbH & Co., Melle, Fed. Rep. of Germany

Filed Sep. 25, 1981, Ser. No. 305,393

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1980, 3037461

Int. Cl.³ B65G *53/42*

U.S. Cl. 406—152 **10 Claims**



1. In a pneumatic suction device for removing slowly movable material from enclosed spaces, of the kind including a suction pipe secured to a pivotable arm, and having a suction aperture and a supply of air arranged to be fed to the suction aperture thereof, and provided with peripherally distributed driven tools for loosening the material, the improvement which comprises at least three axially parallel drivable spindles distributed around and above the suction aperture of said suction pipe, said spindles carrying, one above the other, tools for loosening the material sideways for conveying it to said suction aperture and said suction pipe, adjacent ones of said spindles being rotatable in opposite directions, but at least two adjacent spindles out of an odd number of said spindles being rotatable in the same direction.

4,413,934

MANIFOLD TO UNIFORMLY DISTRIBUTE A SOLID-LIQUID SLURRY

Kenneth C. Kern, Lake Hiawatha, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

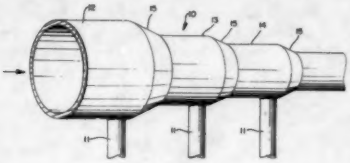
Filed Jul. 20, 1981, Ser. No. 285,003

Int. Cl.³ B65G *53/52*

U.S. Cl. 406—155 **2 Claims**

1. A manifold for uniformly distributing a coal-liquid slurry

including coal particles of different size ranges mixed and suspended in said liquid, comprising, in combination, main conduit means conveying said coal-liquid slurry and including sections of progressively decreasing diameter, each said section being joined to its adjacent section by a converging truncated conical member means, and a plurality of downwardly oriented distributor conduits attached to the sections of said main conduit means immediately adjacent and upstream of

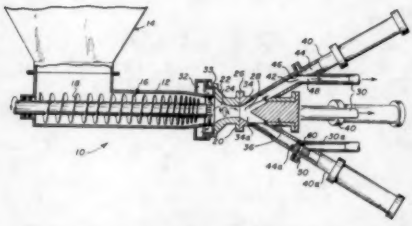


each of said conical member means, said distributor conduits intersecting said main conduit means and terminating in sharp edge terminal portions with said main conduit means to thereby create turbulence and a pressure drop in the main conduit means adjacent the end of each said distributor conduits whereby improved and substantially uniform coal particle size distribution will result in each of said distributor conduits.

4,413,935
FLOW SPLITTER FOR DIVIDING A STREAM OF PULVERULENT MATERIAL INTO MULTIPLE STREAMS

Donald A. Smith, Haddam, and Gary F. Lexa, Rocky Hill, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Jun. 29, 1981, Ser. No. 278,242
Int. Cl.³ B65G *53/56*
U.S. Cl. 406—181 **7 Claims**



1. A flow splitter for dividing a stream of pulverulent material into a multiplicity of substantially equal substreams, the flow splitter comprising:

a. an inlet nozzle defining an open-ended mixing chamber for receiving a stream of pulverulent material and a stream of air for intermixing therein;

b. a distributor housing defining a substantially cylindrical distribution chamber having an inlet for receiving the mixture of pulverulent material and air from the inlet nozzle and a plurality of outlet openings equally spaced about the periphery of and opening from the opposite end thereof;

c. a plurality of outlet valve assemblies equal in number to the number of outlet openings in the distribution chamber, each outlet valve assembly defining a flow conduit having an inlet mated to an outlet opening in the distribution chamber and an outlet opening;

d. a plurality of valve members, one per valve assembly, each valve member slidably disposed within the flow conduit of a valve assembly and retractably movable therein from the inlet thereof when extended to a point downstream of the outlet thereof when retracted, the end face of each valve member contoured to conform with the inner surface of the cylindrical distribution chamber to which the valve assembly mates when the valve member is in its extended position;

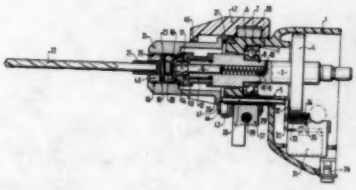
e. purge means opening into the flow conduit of each valve assembly at a location opposite the outlet opening of the flow conduit; and

f. a hole extending traversely through each valve member so as to communicate the purge means with the outlet opening of the flow conduit when the valve member is in its extended position.

4,413,936
CONTROL DEVICE IN A MACHINE TOOL

Gerhard Kuhlmann, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 20, 1980, Ser. No. 199,106
Claims priority, application Fed. Rep. of Germany, Oct. 27, 1979, 2943508
Int. Cl.³ B23B *45/00, 47/00*
U.S. Cl. 408—8 **23 Claims**



1. In a machine tool, particularly for a hand tool machine, including a housing, drive means with a rotary spindle, and tool-receiving means, a control device comprising control means including a motor regulator and a hand switch bridged to said regulator and adapted to adjust the drive means to a predetermined rotation speed; a control element on said tool-receiving means, said control element being an elongated sleeve provided with outwardly radially extending flanges having a control face and arranged to be adjusted in an axial direction; and transmitting means operatively interconnected between said control element and said control means and operative for transmitting forces exerted on said tool-receiving means during operation to said control means, said transmitting means including a longitudinal pin slidably positioned within the housing and having a first end portion arranged to engage said control face so that the position of said pin defines the adjustment of said drive means to a predetermined rotation speed.

4,413,937
ELEMENTS FOR A TOOL SYSTEM

Guenter E. Gutsche, 5330 Forget, St-Louis Terrebonne, Quebec J0N 1N0, Canada

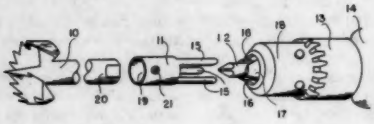
Filed Dec. 18, 1980, Ser. No. 217,798
Int. Cl.³ B23B *45/00, 31/02*
U.S. Cl. 408—239 A **24 Claims**

1. An element for a tool system having an axis of rotation and fitting a chuck, said chuck having convergeable gripping means and a first tool bit rigidly held therein said gripping means having walls defining at least two circumferentially spaced, axially extending recesses, said element comprising:

(a) at least one axially extending prong at one end and substantially parallel to and at a selected distance from said axis of rotation, said prong dimensioned and positioned to slidingly fit over said first tool bit and to fit slidingly into one of said recesses and rotationally abut one of said walls,

said prong being slidably receivable into a space defined by a sector of 60° on said axis of rotation,

(b) centering means that are dimensioned to slidingly fit and at least partially enclose the first tool bit and



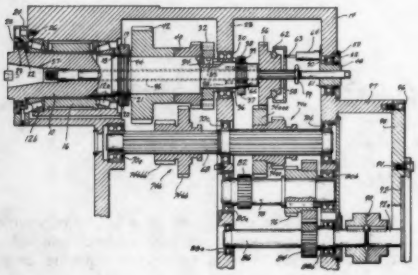
(c) working means at the other end of said element for performing a work operation.

4,413,938

SPINDLE MOTOR POWERED DRAWBAR

Steven R. Kuczenski, New Holstein, Wis., assignor to Kearney & Trecker Corporation, Milwaukee, Wis.

Filed Dec. 21, 1981, Ser. No. 332,608
Int. Cl.³ B23C 5/26
U.S. Cl. 409—233 **7 Claims**



1. In combination with a machine tool having a rotatably driven, tool receiving spindle, a drawbar coaxially disposed in said spindle for threaded engagement into or out of a toolholder disposed within said spindle so as to engage and disengage, respectively, said toolholder, a source of rotational energy, and a gear train for coupling said source of rotational energy to said spindle, a mechanism for rotatably driving said drawbar into or out of said toolholder from said source of rotational energy comprising:

gear means carried on that portion of said drawbar extending beyond said spindle for engaging said gear train;

means for biasing said gear means out of engagement with said gear train; and

shifter means for urging said gear means against said biasing means to bring said gear means into engagement with said gear train so that said drawbar can be rotatably driven through said gear means and said gear train from said source of rotational energy.

4,413,939

BAR STOCK FEEDER

John M. Peris, Elmira, N.Y., assignor to Hardinge Brothers, Inc., Elmira, N.Y.

Filed Jul. 28, 1981, Ser. No. 287,557
Int. Cl.³ B65H 5/16
U.S. Cl. 414—17 **15 Claims**

1. A bar stock feeder assembly for use with a machine tool, comprising:

a. a bar stock feed tube assembly including an inner tube and a slightly larger outer concentric therewith,

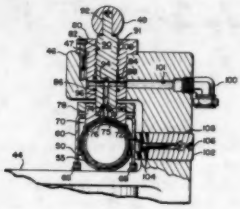
b. a pneumatically operative plunger assembly disposed within the inner tube for engaging bar stock and moving said bar stock toward the machine tool,

c. a support standard assembly for supporting the feed tube assembly horizontally and in alignment with the machine tool,

d. the support standard assembly including a lower support,

e. a vertical standard extending upwardly from the lower support and having a horizontally extending carrier member,

f. the carrier member having a horizontal feed tube supporting surface and an upright bar tube section which extends over and clear of the horizontal bar supporting surface,



g. the bar tube retaining section having an operable locking assembly and including an integral spiral threaded plunger which moves downwardly toward the horizontal feed tube supporting surface,

h. the bar stock feed tube assembly having an upwardly extending locking and feeder seat engaging means which is axially aligned with said spiral threaded plunger for engaging said spiral threaded plunger when the feed tube assembly is aligned with the machine tool, and which has a central receiving conduit, and

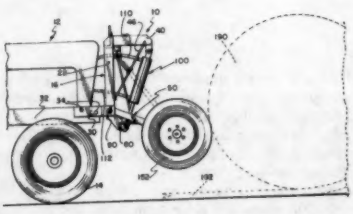
i. the spiral threaded plunger having a central supply conduit which is moved into direct communication with the feeder receiving conduit when the spiral threaded plunger is lowered into locking engagement with the feeder seat.

4,413,940

ROLLED BALE HANDLER

Jesse M. Southard, and John E. Diehl, both of Rte. #1, Hoyt, Kans. 66440

Filed Mar. 4, 1981, Ser. No. 240,278
Int. Cl.³ A01D 87/12
U.S. Cl. 414—24.6 **13 Claims**



1. A bale roller attachment for tractors and the like, comprising an upstanding and transversely disposed rigid support frame provided with means adapted for securely mounting the same in fixed relation on the front end of a tractor, an auxiliary open and rigid frame having an overall generally rectangular and planar configuration, said auxiliary frame being disposed forwardly of the support frame and having one end pivotally mounted to a lower portion of the support frame for movement about a transverse and horizontal axis between an upwardly and forwardly inclined retracted position and a relatively

lower forwardly extending operative position, means operatively connecting the support and auxiliary frames at locations that are respectively remote from the axis for selectively supporting the auxiliary frame from the support frame in its retracted and operative positions, said auxiliary frame having an end remote from the axis that has as its transverse and forward extremities a pair of oppositely and transversely extending stub axles, with said stub axles being horizontal and aligned with each other in fixed parallelism to said axis, and a pair of wheels freely and independently journaled upon said stub axles, the arrangement being such that space forward of the auxiliary frame is substantially unobstructed between the wheels.

4,413,941

MACHINE TOOL SUPPORT TABLE AND FEEDING DEVICE

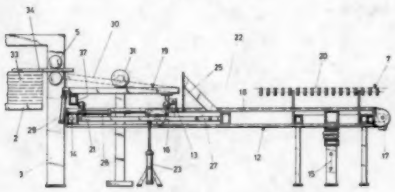
Horst Kollmann, Dornbirn, Austria, assignor to Firma Schelling & Co., Schwarzach, Austria

Filed Mar. 27, 1981, Ser. No. 248,478

Claims priority, application Austria, Mar. 31, 1980, 1715/80

Int. Cl.³ B65H *31/30*

U.S. Cl. 414—35 **5 Claims**



1. Apparatus for feeding planar workpieces in a machine tool assembly, particularly upon a worktable for a cutting saw, comprising: support table means including a plurality of rollers arranged in adjacent rows and defining a support plane for said workpieces; feeding means for feeding said planar workpieces into said apparatus; reciprocating carriage means having a grated support surface operably interposed between said feeding means and said support table means for delivering said planar workpieces to said support table means when said carriage means is moved in a feeding direction; tracks extending between said feeding means and said support table means movably mounting said carriage means thereon, said carriage means being arranged on said tracks to have said grated support surface vertically adjustable in height between a raised position located above said support plane and a lowered position located below said support plane; and alignment stop means arranged to be moved between said carriage means and said support table means when said carriage means is moved against said feeding direction and to be pivoted out of the path of said carriage means when said carriage means is moved in said feeding direction; said grated support surface of said carriage means being composed of a plurality of girders extending in the feeding direction of said carriage means and spaced apart from each other wherein at least a portion of said plurality of girders are adapted to be raised at their ends closest to said feeding means; said upwardly movable ends of said girders being connected with each other by a transverse girder supported by a lifting device which is fixedly mounted sidewise of said carriage means.

4,413,942

LIFT-TYPE CAR PARK

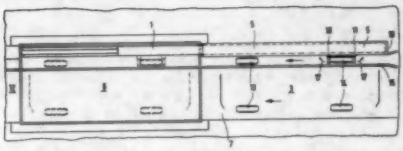
Anton Roth, deceased, late of Hanau am Main, Fed. Rep. of Germany, and by Guenther Moeller, executor, Wuelfrath, Fed. Rep. of Germany, assignors to Mercator Gesellschaft fur Entwicklung und Technik mbH, Dreieich, Fed. Rep. of Germany

Continuation of Ser. No. 133,411, Mar. 24, 1980, abandoned. This application Sep. 30, 1982, Ser. No. 428,943

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1979, 2911182

Int. Cl.³ E04H *6/00*

U.S. Cl. 414—253 **4 Claims**



1. A lift type car park for removably storing a plurality of wheeled vehicles, said car park having:

an entrance; at least one transfer location at said entrance, said entrance transfer location including a floor for supporting wheeled vehicles; a plurality of parking spaces disposed on levels spaced vertically from said entrance transfer location floor;

at least one movable platform means which can be aligned with said floor and each of said levels for transporting motor vehicles from said entrance transfer location to said levels;

said entrance transfer location having a vehicle position and a passenger entry and exit position alongside said vehicle position to permit passengers to enter and exit a vehicle in said vehicle position;

a tunnel member mounted to and rising above said floor in said vehicle entry and exit position, said tunnel member having a slot shaped aperture disposed in a side of said tunnel facing said vehicle position and aligned with the horizontal direction of transport of said motor vehicle, said tunnel member having a substantially flat continuous upper surface above said aperture for supporting passengers entering and exiting a vehicle, said tunnel member having an entry opening facing said platform means;

telescopic means mounted on said platform, said telescopic means being movable from a retracted position in which said telescopic means is completely received on said platform to an extended position; said tunnel member being aligned with said telescopic means when said platform is aligned with said floor such that said telescopic means is received in said tunnel through said entry opening when in the extended position;

guiding and gripping means extendable through said slot shaped opening and connected to said telescopic means for removably engaging at least one wheel of said motor vehicle at a position above said floor and rolling said vehicle along said floor on its own wheels onto said platform when said telescopic means is moved from said extended position to said retracted position; and

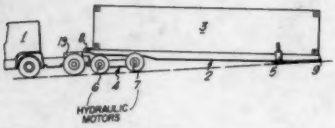
wheel guide means disposed adjacent tunnel member for guiding the wheel of said vehicle as it moves along said floor.

4,413,943

METHOD AND APPARATUS FOR LOADING AND UNLOADING A LENGTHY OBJECT FROM A TRANSPORT VEHICLE

Leo L. Liljestrom, Renvallinkuja 4, 00840 Helsinki 84, Finland

Continuation-in-part of Ser. No. 91,532, Nov. 5, 1979, abandoned. This application Jul. 9, 1981, Ser. No. 281,912
Claims priority, application Finland, Nov. 8, 1978, 783399
Int. Cl.³ B60P *1/28*
U.S. Cl. 414—475 **5 Claims**



1. A method of loading a lengthy object onto a transporting vehicle comprising a tractor and a trailer having adjustable support legs at its rear end, a bogie wheel assembly movable in the longitudinal direction of the trailer, and a winch for pulling the object onto the trailer, comprising the steps of:

supporting the rear end of the trailer by means of its support legs;

shifting the bogie wheel assembly to the front of the trailer;

decoupling the tractor from the trailer as the bogie wheel assembly nears the front of the trailer;

coupling the bogie wheel assembly to the tractor;

moving the tractor forward from beneath the trailer;

lowering the rear end of the trailer to the ground; and

pulling the object onto the trailer by means of the winch.

3. Apparatus for facilitating the loading and unloading of the trailer of a tractor-trailer combination, comprising:

means to couple and decouple the tractor and trailer;

adjustable support legs disposed at the rear end of the trailer;

a bogie wheel assembly normally attached to the rear end of the trailer and movable to the front end of the trailer a distance sufficient to push the tractor from beneath the trailer so that the front end of the trailer is supported by the bogie wheel assembly alone;

means for moving the bogie wheel assembly along the trailer; and

means for coupling the bogie wheel assembly to the tractor when the bogie wheel assembly is moved to its forward position.

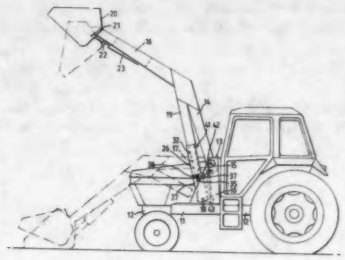
4,413,944

TRACTOR FRONT LOADER WITH LOCKING STRUT

Anthony D. Coe, Manchester, England, assignor to David Brown Tractors Ltd., Huddersfield, England

Filed Mar. 3, 1981, Ser. No. 240,058
Claims priority, application United Kingdom, Mar. 14, 1980, 8008806
Int. Cl.³ B66C *23/36*
U.S. Cl. 414—685 **4 Claims**

1. A tractor front-end loader having support frame means comprising two channel structures adapted to be rigidly secured to opposite sides of the tractor, respective parallel interconnected booms pivotable on said structures between lowered and raised positions, respective hydraulic ram-and cylinder assemblies for pivoting said booms, and at least one telescopic locking strut comprising mutually slideable members which is housed partially within one of the channel structures and is pivotable thereon between a retracted inoperative position in which it is secured to said one structure and an extended operative position in which it locks said booms in raised position, wherein one of the mutually slideable members is pivotally mounted on said one structure by a part-circular surface formed at one end of said one member and extending through an arc of more than 180° which co-operates with a circular boss forming part of said one structure and provided with a flat on its periphery, said boss housing a pivot pin which connects the ram of the associated ram-and-cylinder assembly to said one structure and the arrangement being such that the telescopic locking strut is removable from the loader by first



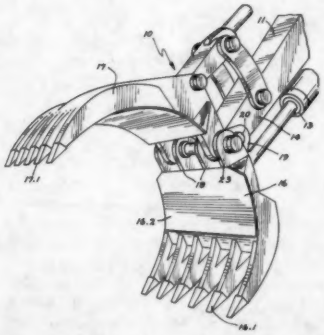
disconnecting said ram from said one structure and then pivoting said strut to an angular position in which said surface is moveable radially away from the boss by virtue of the flat on the boss.

4,413,945

GRAPPLE RAKE FOR BACKHOE

Roy E. LaBounty, 1607 - 8th Ave., Two Harbors, Minn. 55616

Filed Sep. 28, 1981, Ser. No. 305,946
Int. Cl.³ B66C *3/16*
U.S. Cl. 414—739 **5 Claims**



1. A grapple rake for attachment onto the end of the dipper stick of a backhoe, comprising

a single generally upright back jaw to traverse the dipper stick and having upper and lower ends, lateral edges and front and back sides, the front side being concavely curved,

a swingable front jaw to traverse the end of the dipper stick and having inner and outer ends, lateral edges and front and back sides, the front side being concavely curved to cooperate with the back jaw,

attachment means of the upper end of the back jaw and on the inner end of the front jaw and including a swing shaft for swingably interconnecting the jaws together,

positioning means on the jaws and dipper stick for swinging both jaws relative to the dipper stick,

a pair of parallel mounting ears on the back jaw with apertured portions protruding rearwardly of the back side of the back jaw in a spaced relation to each other to receive the end of the dipper stick therebetween, and the apertured portions having a pivot pin in the apertures thereof and extending through the dipper stick to pivotally carry

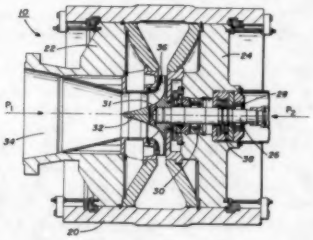
the back jaw and permit the back to lie against the dipper stick while the front jaw is used for raking, the mounting ears having inner faces confronting each other at the end of the dipper stick therebetween and also having outer faces, and a pair of rigid depending ears on the inner end of the front jaw and respectively facing the outer faces of said adjacent mounting ears at opposite sides of the dipper stick, the swing shaft swingably connecting the depending ears with the mounting ears and being movable around the end of the dipper stick as the back jaw is swung, the front jaw thereby being adapted to swing through a full range of opening and closing regardless of whether the back jaw is oriented transversely of the dipper stick or is laid back along the dipper stick.

4,413,946

VENTED COMPRESSOR INLET GUIDE

Dale F. Marshall, Allegany, and Ted C. Evans, Olean, both of N.Y., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 20, 1981, Ser. No. 294,592
Int. Cl.³ F04B *15/00*
U.S. Cl. 415—28 **7 Claims**



1. In a centrifugal compressor having an overhung rotor including a shaft mounted for rotation, an impeller secured to said shaft for rotation therewith and a thrust bearing supporting said shaft against thrust loads imposed thereon, the improvement comprising apparatus for limiting the thrust load imposed against said rotor and comprising means in combination for controllably venting the low pressure side of the compressor exposed to said rotor and including:

(a) an aperture defined through a compressor wall from an inlet on the low pressure side of the compressor;

(b) labyrinth means for substantially sealing flow from said aperture to permit only a predetermined controlled leakage therepast;

(c) conduit means for communicating leakage from the outlet of said aperture to a relatively lower pressure receiving source; and

(d) presettable control means operative at a set point correlated to the allowable thrust load design capacity of said thrust bearing and responsive to values of pressure in said conduit means to open and close said conduit means to leakage flow at pressure above and below the set point, respectively.

4,413,947

FAN ARRANGEMENT

Nakanobu Seki, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

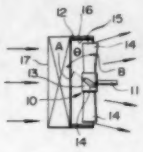
Filed Sep. 10, 1981, Ser. No. 300,743
Claims priority, application Japan, Oct. 24, 1980, 55-151891
Int. Cl.³ F00I *1/02*; F01P *7/10*
U.S. Cl. 415—182 **7 Claims**

1. A fan arrangement comprising:

(a) a rotatable fan (**10**);

(b) a plurality of blades (**14**) formed on the fan, the blades extending radially and being spaced circumferentially, the blades also extending perpendicularly to the radial direction, a base angle θ of each blade being set at a value of 55° to 75°, the base angle θ being defined by the angle at which lines A and B intersect where the line A corresponds to the longest chord of the transverse section of each blade at its base and the line B is the line of intersection between the section plane for the blade and perpendicular plane with respect to the fan axis of rotation; and

(c) a shroud (**12**) located on the periphery of the fan so as to cover a part of the fan in such a manner that the fan is



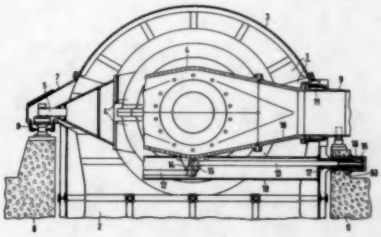
partially exposed at its downstream part and a clearance is formed between the shroud and the fan, the covering percentage of the shroud relative to the fan being set at a value of 50% to 90%, the covering percentage being defined as $100\text{-}L_2/L_1$, where L_1 is the axial width of the outer edge of each blade and L_2 is the axial distance of the shroud from the downstream end thereof to a point in the same axial position as the upstream end of the outer edge of each blade, the optimum covering percentage depending on the base angle θ.

4,413,948

DOUBLE SHELL STEAM TURBINE HOUSING ASSEMBLY

Gerhard Purr, Mülheim-Ruhr, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mülheim-Ruhr, Fed. Rep. of Germany

Filed Jul. 21, 1982, Ser. No. 400,582
Claims priority, application Fed. Rep. of Germany, Jul. 31, 1981, 3130376
Int. Cl.³ F01D *25/26, 25/28*
U.S. Cl. 415—219 R **6 Claims**



1. Double shell steam turbine housing assembly having an inner housing and an outer housing separated from the inner housing, a base plate and lateral support arms supporting the inner housing on the base plate, comprising centering guide means for maintaining the inner housing in a central position, said centering guide means including a double-armed lever connected to the inner housing and a pair of elongated guide bars secured, respectively, at mutually opposite sides of the housing assembly to the base plate and articulatingly connected, respectively, to opposite ends of said double-armed lever, said guide bars extending through the outer housing.

4,413,949

ROTOR BLADE FOR GAS TURBINE ENGINES

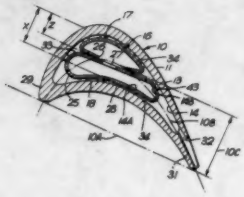
Alexander Scott, Bristol, England, assignor to Rolls Royce (1971) Limited, London, England

Filed Sep. 30, 1975, Ser. No. 618,688

Claims priority, application United Kingdom, Oct. 17, 1974, 44948/74

Int. Cl.³ F01D *5/18*

U.S. Cl. 416—96 A **7 Claims**



1. Rotor blade for gas turbine engines comprising a hollow aerofoil (**11**), a first hollow insert (**17**) situated between opposite first and second interior surfaces (**14A, 14B**) of the aerofoil in an operative position in which the insert is in closer proximity with the second (**14B**) than the first (**14A**) surface, a root (**12**) having an opening (**15**) including opposite first and second surfaces (**15A, 15B**) which are spaced apart by a distance greater than the width of the first insert but less than the spacing between surfaces of said interior, the second surface (**14B**) of said interior defining a recess (**14C**) in respect of the second surface (**15B**) of the opening, a second hollow insert (**18**) situated in an operative position between the first insert (**17**) being insertable through the opening (**15**), the first insert being displaceable laterally into said recess to attain said operative position thereof and the second insert (**18**) being insertable after said lateral displacement of the first insert, and passage means (**24**) for introducing cooling air into the interior of the inserts.

4,413,950

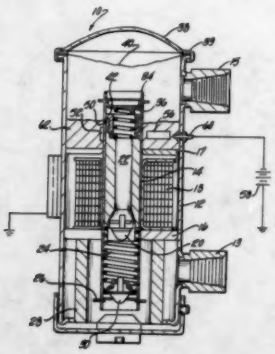
HALL SWITCH PUMP

Michael V. Wiernicki, Trumansburg, N.Y., assignor to Facet Enterprises, Incorporated, Tulsa, Okla.

Filed Sep. 25, 1980, Ser. No. 191,055

Int. Cl.³ F04B *17/04*; H02K *33/10*

U.S. Cl. 417—53 **16 Claims**



1. A method for reciprocating a magnetically permeable piston member along a predetermined path in an electromagnetic device having a resilient member urging said magnetically permeable piston member in one direction along said predetermined path and a solenoid coil for pulling said magnetically permeable piston member in the opposite direction against the force of said resilient member, said method comprising the steps of:

reciprocating a magnet attached to said magnetically permeable piston member along said predetermined path, the magnetic poles of said magnet being arranged parallel to the direction of motion of said magnetically permeable piston member along said predetermined path;

placing a hall effect switch sensitive to the direction of the magnetic field generated by said magnet intermediate the two extremes of the motion of said magnet as it is reciprocated with said magnetically permeable piston member to generate a differential signal having a magnitude and polarity indicative of the position of said magnetically permeable piston member along said path;

activating an electronic switch circuit to energize the solenoid coil in response to said differential signal having a magnitude and polarity indicative of said magnetically permeable piston member being pushed to a position near said one end of said predetermined reciprocation path of said magnet under the influence of said force generated by said resilient member, said step of activating said electronic switch means to energize the solenoid coil comprising the steps of detecting when said differential signal has a predetermined magnitude and a first polarity to generate a SET signal, switching a bi-stable means to a first state in response to said SET signal to generate a biased signal, connecting a transistor means in series with said solenoid coil to control the current flow therethrough, and forward biasing said transistor means to its conductive state with said biased signal to energize said coil; and

activating said same electronic switch circuit to de-energize said solenoid coil in response to said signal having a magnitude and polarity indicative of said magnetically permeable piston member being pulled to a position near said other end of said predetermined reciprocation path of said magnet under the influence of said force generated by said energized coil, said step of activating said electronic switch circuit to deenergize said solenoid coil comprising the steps of detecting when said differential signal has a second predetermined magnitude and a reversed polarity opposite said first polarity to generate a RESET signal, switching a bi-stable means to its second state in response to said RESET signal to terminate said biased signal, and backward biasing said transistor means with the termination of said biased signal to its nonconductive state to deenergize said solenoid coil;

wherein said hall effect device produces a first signal at a first output terminal and a second signal at a second output terminal and said differential signal is the difference between said first and second signals, said first step of detecting compares the magnitude of difference between said first and second signal having a predetermined polarity to generate said SET signal; said second step of detecting compares the magnitude of the difference between said first and second signal having an opposite polarity to generate said RESET signal.

4,413,951

CAPACITY CONTROL ARRANGEMENT FOR FIXED SPEED COMPRESSOR

Clifford W. Allen, Jr., Lexington, Ky., assignor to Lexair, Inc., Lexington, Ky.

Filed Oct. 6, 1980, Ser. No. 194,021

Int. Cl.³ F04B *49/02*

U.S. Cl. 417—53 **24 Claims**

1. In combination:

a compressor operating at a fixed speed;

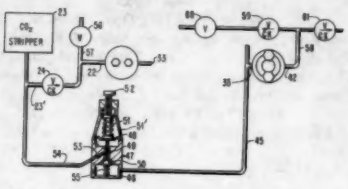
gas generating means producing a varying supply of gas; said compressor having its inlet communicating with said gas generating means to receive gas therefrom;

said compressor including means to compress the gas entering said inlet of said compressor;

said compressor having an outlet to discharge the compressed gas;

first connecting means to provide communication between said outlet of said compressor and said inlet of said compressor exterior of said compressor, said first connecting means providing the sole communication between said outlet of said compressor and said inlet of said compressor;

valve means in said first connecting means to block said first connecting means when said gas generating means is supplying sufficient gas to maintain the pressure of the gas



at the inlet of said compressor above a predetermined pressure;

said first connecting means having causing means solely therein to cause movement of said valve means to a position in which said valve means does not block said first connecting means when the pressure at the inlet of said compressor drops below the predetermined pressure;

and said causing means including means responsive solely to the pressure of the gas supplied from said gas generating means to cause movement of said valve means to the position in which said valve means does not block said first connecting means.

4,413,952

SMALL TEMPERATURE DIFFERENTIAL HEAT-POWERED COMPRESSOR

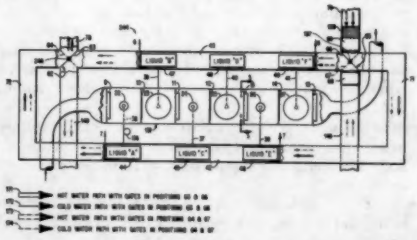
Francis L. Burnham, Orangeburg, S.C., assignor to Orangeburg Technologies, Inc., Orangeburg, S.C.

Continuation of Ser. No. 242,242, Mar. 10, 1981, Pat. No. 4,372,114. This application Jul. 15, 1982, Ser. No. 398,564

The portion of the term of this patent subsequent to Aug. 31, 1999, has been disclaimed.

Int. Cl.³ F04B *25/00*

U.S. Cl. 417—253 **7 Claims**



1. A pump system for pumping a first fluid from a source to an output facility comprising:

a. a multiple-stage pump comprising:

(1) a plurality of pumping stages; and

(2) a plurality of check valves, one of said plurality of check valves being located on the input and output of said multiple-stage pump and between each of said plurality of pumping stages;

b. each of said plurality of pumping stages comprising:

(1) a pressure chamber operable to hold said first fluid; and

(2) a flexible member within said pressure chamber operable, when expanded, to exert pressure against said first fluid and to force said first fluid from said pressure chamber through the one of said plurality of check valves between said pressure chamber and the next pressure chamber of the next subsequent pumping stage of said plurality of pumping stages or said output, if said pressure chamber is within the last of said plurality of pumping stages, when said pressure within said pressure chamber exceeds the next pressure in said next pressure chamber or said output;

c. each of said flexible members, connected to a container which is one of a plurality of containers; and

d. a plurality of vaporizable fluids, one of said plurality of vaporizable fluids contained within each one of said plurality of containers,

whereby each said container holds one of said plurality of vaporizable fluids and when said container is subjected to a hot temperature, said one of said plurality of vaporizable fluids vaporizes causing said flexible member to expand and when said container is subjected to a cold temperature, said one of said plurality of vaporizable fluids condenses causing said flexible member to contract,

wherein each said one of said plurality of vaporizable fluids which vaporizes into said flexible member has a higher pressure, when heated to said hot temperature, than the cold pressure of the next said one of said plurality of vaporizable fluids which vaporizes into the next flexible member within said next pressure chamber or to said output, if said flexible member is within said last of said plurality of pumping stages,

wherein connected to said plurality of pumping stages are a first heat exchanger and a second heat exchanger which utilize a hot fluid to provide said hot temperature and a cold fluid to provide said cold temperature.

4,413,953

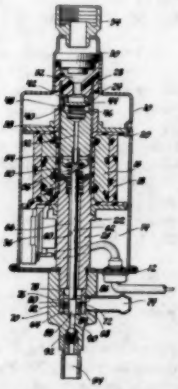
TWO-STAGE HYDRAULIC PISTON PUMP

Douglas I. Fales, Burton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 21, 1981, Ser. No. 332,369

Int. Cl.³ F04B *3/00, 17/04, 39/10*

U.S. Cl. 417—262 **4 Claims**



1. A two-stage solenoid operated hydraulic pump comprising; a pump cylinder and housing assembly having a nonmagnetic pump cylinder portion; a solenoid coil surrounding a portion of said pump cylinder and housing assembly; spring means disposed in said pump cylinder; an armature piston slidably disposed in said nonmagnetic pump cylinder portion and cooperating therewith to form a first pump means operable to pump fluid through cooperation of said solenoid coil energi-

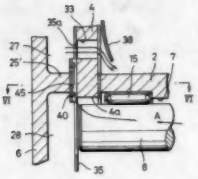
zation and said spring means; an inlet valve for admitting fluid to said first pump means; a delivery passage for delivering fluid from said first pump means; second pump means including a piston secured to and reciprocable with said armature piston, a cylinder means for receiving a portion of said piston when said piston is reciprocated, said cylinder including an inlet passage in fluid communication with said delivery passage, an overflow passage for directing excess fluid delivered by said first pump means from said cylinder means and being disposed to be closed by said piston during the discharge stroke of said second pump means prior to said inlet passage being closed and outlet passage means for delivering fluid from said second pump means; and outlet valve means disposed in fluid communication with said outlet passage means for preventing discharged fluid from reentering said second pump means.

4,413,954

SWASH-PLATE TYPE COMPRESSOR HAVING PUMPLESS LUBRICATING SYSTEM

Michio Okazaki, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Saitama, Japan

Filed Jul. 20, 1981, Ser. No. 284,694
Claims priority, application Japan, Jul. 31, 1980, 55-105267
Int. Cl.³ F04B *1/16, 1/18*
U.S. Cl. 417—269 **6 Claims**



1. A swash-plate type compressor which comprises:

a cylinder block having an axial hole extending along an axis thereof, a plurality of cylinder bores axially extending therethrough in circumferentially spaced arrangement, and a swash plate chamber defined therein at a substantially axial center thereof;

a drive shaft inserted in said axial hole in said cylinder block;

a plurality of pistons slidably mounted within said cylinder bores;

a swash plate secured on said drive shaft at a boss thereof, said swash plate being arranged within said swash plate chamber;

a pair of valve plates mounted at opposite ends of said cylinder block, said valve plates each having a central opening aligned with and communicating with said axial hole, a plurality of suction openings each opening in an associated one of said cylinder bores in said clyinder block, said drive shaft extending through said central opening in at least one of said valve plates;

a pair of thrust bearings mounted at opposite ends of said boss of said swash plate for bearing thrust loads applied to said swash plate;

a pair of radial bearings mounted in said axial hole in said cylinder block at locations close to opposite ends of said axial hole for supporting said drive shaft in radial directions; and

a pair of passageways each including a communication passage, said communicating passage having one end opening in said central opening of an associated one of said valve plates and the other end opening in at least one of said suction openings of said associated one of said valve plates, said passageways each extending from said swash plate chamber to said at least one of said suction openings through said axial hole, said central opening and said communication passage;

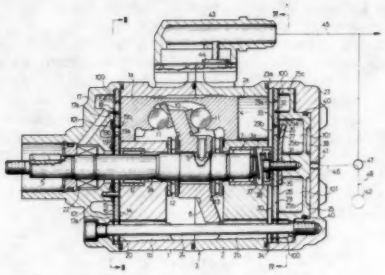
wherein said at least one of said suction openings has a diameter smaller than that of an associated one of said cylinder bores such that as refrigerant passes said at least one suction opening it has a flow velocity thereof increased to a value enough to cause a considerable pressure drop in said communication passage during the suction stroke of an associated one of said pistons within said associated cylinder bore, whereby oily mist in said swash plate chamber is guided through said axial hole, said central opening, said communication passage and said at least one suction opening into said associated cylinder bore due to an increased pressure difference between the internal pressure of said swash plate chamber and pressure in said communication passage, which is caused by said pressure drop in said communication passage.

4,413,955

SWASH PLATE COMPRESSOR

Kimio Kato; Hisao Kobayashi, both of Kariya; Takamitsu Mukai, Anjo; Hiroya Kono, Kariya, and Taku Yamamoto, Obu, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Mar. 19, 1982, Ser. No. 359,951
Claims priority, application Japan, Mar. 28, 1981, 56-45864
Int. Cl.³ F04B *49/02, 1/18*
U.S. Cl. 417—270 **5 Claims**



1. A swash plate compressor comprising, in combination,

a main body of the compressor consisting of mutually connected front and rear cylinder blocks,

a front housing and a rear housing respectively mounted to front and rear end faces of the body member by the medium of front and rear valve plates in each of which suction ports and discharge ports are provided,

a rotary shaft inserted into the center bore of the body member from the front housing side,

a plurality of cylinder bores provided in said cylinder blocks for extending in the front and rear direction and parallel to and radially outwardly of said rotary shaft, p0 a plurality of pistons mounted in each of said cylinder bores and reciprocable therein by means of a swash plate which is mounted on said rotary shaft for performing a unitary rotation therewith, and

a suction flange and a discharge frange connected respectively to a suction passage and a discharge passage provided in the body member of the compressor, wherein the improvement comprises,

an inner housing in the form of a bottomed cylinder mounted in the rear housing for movement axially of said rotary shaft in such a manner that the front end face of the inner housing acts for closing or exposing the rear face of the body member of the compressor through the medium of said rear valve seat,

a discharge chamber delimited by a partition wall so as to lie centrally on the front surface of said inner housing, said discharge chamber communicating with said cylinder bores through discharge ports in said valve plate, said discharge chamber also communicating with said discharge passage,

a suction chamber delimited on the front surface of the inner housing by said partition wall so as to lie radially outwardly of said discharge chamber, said suction chamber communi-

cating with said cylinder bores through suction ports in said valve seat, said suction chamber also communicating with said suction passage,

spring means arranged in said body member for normally urging said inner housing and said valve plate on the front surface thereof towards rear;

a pressure chamber defined between the rear surface of said inner housing and the inner surface of the rear housing, said pressure chamber being operative upon increase in the inside pressure to shift said inner housing and the rear valve plate towards front against the pressure of said spring means for abutting said rear valve plate against the rear end face of the body member of the compressor for stopping up said rear end face,

changeover valve means provided halfway in a conduit passage interconnecting said pressure chamber with a high pressure source or a low pressure source, and

check valve means provided halfway in said discharge passage for preventing reversed flow of the pressurized gas from said discharge flange into the discharge chamber of said inner housing in the absence of the compression operation in the rear cylinder block.

4,413,956

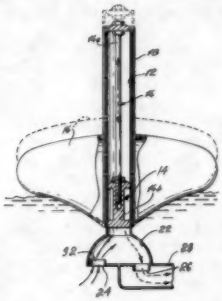
WAVE PUMP APPARATUS

John L. Berg, P.O. Box 1282, Vallejo, Calif. 94590

Continuation-in-part of Ser. No. 81,013, Oct. 1, 1979, Pat. No. 4,302,161. This application Sep. 23, 1981, Ser. No. 304,648

Int. Cl.³ F03B *13/12*

U.S. Cl. 417—333 **3 Claims**



1. A wave pump apparatus comprising a super-structure type frame, floats mounted on the frame below the super-structure and adapted to float the frame, the floats including at least a pair thereof which are spaced apart one from the other a distance approximating the average wave length of a particular wave pattern of a body of water, a plurality of wave pumps provided below the super-structure, each wave pump including a cylinder, a piston movable in the cylinder, a float on the exterior of the cylinder directly connected to the piston, chamber means communicating with the cylinder, a generator provided on the super-structure and communicating with the wave pumps, and each wave pump adapted to supply water under pressure to the generator for turning the generator.

4,413,957

PORTABLE, HAND HELD, HIGH PRESSURE PUMP

David H. Sanders, P.O. Box 502, Hamlin, Tex. 79520

Filed Mar. 22, 1978, Ser. No. 888,846

Int. Cl.³ F04B *35/04, 21/04, 39/14*

U.S. Cl. 417—415 **2 Claims**

1. A high speed, hand carried, motor operated pump, which pump comprises:

a. a pump cylinder housing,

(i) a plunger mounted within said pump cylinder housing for reciprocation therein,

(ii) an elastomer cup mounted on said plunger,

(iii) a perforate plate on said cup,

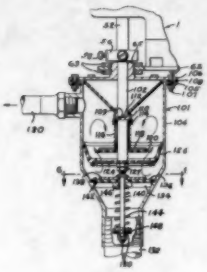
(iv) said plunger being connected in reciprocating relation with the motor,

b. a reservoir,

(i) a valved inlet opening in said pump cylinder housing,

(ii) said inlet valve being interposed between said inlet opening and said elastomer cup so as to control the flow of fluid into said cylinder housing,

c. an abutment formed on said plunger to form a valve seat,



d. an elastomer valve operatively positioned for opening and closing the perforations of said plate,

(i) a stem passing through said elastomer valve,

(ii) a spring surrounding said stem and being biased between said stem and said valve seat so as to cause the elastomer valve to sit on the valve seat, when in one position,

(iii) an elastomer seal interposed between the upper face of said cylinder housing and said elastomer cup,

(iv) said elastomer seal being secured to said plunger intermediate said elastomer cup and the head of said cylinder housing.

4,413,958

APPARATUS FOR INSTALLATION IN WELLS

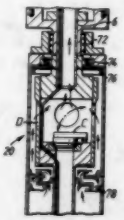
Alan D. Webb, Hinchley Wood, England, assignor to The British Petroleum Company Limited, London, England

Filed Jul. 16, 1980, Ser. No. 169,381

Claims priority, application United Kingdom, Jul. 18, 1979, 7925088

Int. Cl.³ F04B *17/00*

U.S. Cl. 417—424 **8 Claims**



1. An electric pump suitable for location in a well to lift fluids in the well, the pump having an electric motor comprising a rotor and a stator, the stator being fixed and internal with respect to the rotor and having a central aperture extending axially therethrough of a dimension sufficient to permit wire line operations to be conducted through the aperture in the well below the pump, the rotor having a plurality of fluid impellers attached thereto, the pump further comprising a

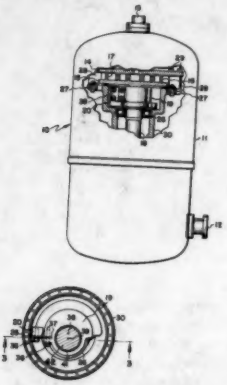
non-return valve located in said aperture and biased in the open position when the pump is inoperative but closable by the wash of well fluids when the pump is working.

4,413,959

SCROLL MACHINE WITH FLEX MEMBER PIVOTED SWING LINK

Arthur L. Butterworth, La Crosse, Wis., assignor to The Trane Company, La Crosse, Wis.

Filed Oct. 19, 1981, Ser. No. 312,556
Int. Cl.³ F01C *1/02, 17/06*
U.S. Cl. 418—14 **12 Claims**



1. A scroll type positive fluid displacement apparatus comprising

a. two generally parallel plates, the facing surface of each having an involute wrap element attached thereon in fixed angular, intermeshed relationship with each other, contacting surfaces of said plates and wrap elements defining pockets of fluid;

b. a drive shaft rotatably driven about its longitudinal axis, said drive shaft at one end thereof, having a crank post offset from the longitudinal axis of the drive shaft;

c. swing link means for coupling the drive shaft in radial compliance to one of the two parallel plates so that rotation of the drive shaft causes the involute wraps associated with said one of the plates to orbit within the involute wrap of the other plate, thereby causing pockets of fluid to move between an inlet and an outlet; and

d. a flex member of resilient material connecting the crank post of the drive shaft with an adjacent parallel surface of the swing link means and operative to transmit rotational driving force from the drive shaft to the swing link, said flex member being rigid in tension, but flexible in bending, so that by its spring force it biases the involute wrap elements slightly apart when the drive shaft is not rotating, to reduce the driving torque required upon start-up of the scroll apparatus.

4,413,960

POSITIONABLE CONTROL DEVICE FOR A VARIABLE DELIVERY PUMP

Victor J. Specht, 197 S. Saginaw St., Pontiac, Mich. 48058

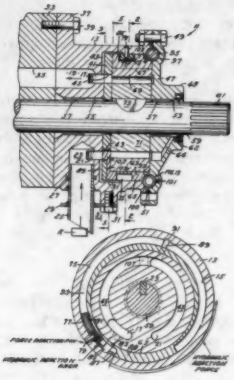
Filed Apr. 2, 1981, Ser. No. 250,341
Int. Cl.³ F04C *2/10, 15/04*
U.S. Cl. 418—19 **16 Claims**

1. In a fluid rotary power transmission having a housing with a cylindrical bore, a fluid intake and a fluid outlet communicating with said bore through a port plate having a fixed crossover land and a movable crossover land separating said fluid intake from said fluid outlet;

a positionable control device comprising a cylindrical body having an outer diameter rotatably and adjustably nested in said bore;

and having an inner diameter eccentric to said outer diameter;

a fluid power mechanism including an outer controlled member rotatably nested within said body and a power driven inner control member rotatably nested within said controlled member and eccentric thereto, and drivably engaging the controlled member to provide a fluid pumping action between said intake and outlet;



the eccentric position between said controlled and control members being variable for selectively increasing and decreasing the volume outlet of fluid;

selective rotation of said positionable control device within said housing and relative to said controlled and control members correspondingly modifying and changing said eccentric position, relative to said fixed crossover land.

4,413,961

MOTION CONVERSION DEVICE AND ROTARY DISPLACEMENT DEVICE

Peter J. Griffin, 13/40 Bayswater Rd., Kings Cross, New South Wales, Australia

Filed Jul. 8, 1981, Ser. No. 281,417
Int. Cl.³ F04C *2/00;* F16H *35/02*
U.S. Cl. 418—38 **20 Claims**

1. A motion conversion device comprising a cam mounted for rotation about an axis eccentric to a central axis, said eccentric axis being rotatable about said central axis, the cam having N lobes the outermost points of which are equally spaced around and equidistant from the eccentric axis, N being an odd integer other than 1, means for effecting relative rotation between the central axis and the cam on rotation of the eccentric axis about the central axis or rotation of the cam about its eccentric axis whereby the cam is arranged to rotate about its

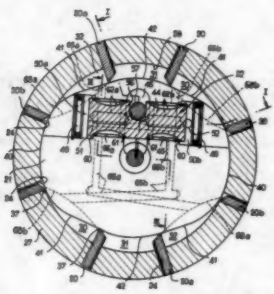
eccentric axis at an angular velocity of 2/N+1) times the angular velocity of the eccentric axis about the central axis, a pair of cam followers rotatable about an axis substantially coincident with the central axis, the cam followers being in contact with the cam on opposed sides of the central axis and equidistant from the central axis, the cam being formed such that on rotation of the eccentric axis about the central axis at a substantially constant velocity the cam followers undergo 2N cycles of acceleration from a dwell condition and deceleration to a dwell condition for each revolution of the cam followers.

4,413,962

TORQUE-AMPLIFYING SERVO-MECHANISM WITH COMPACT STRUCTURE FOR POWER STEERING SYSTEMS

Gilbert Kervagoret, Argenteuil, France, assignor to Societe Anonyme DBA, Paris, France

Filed Sep. 17, 1981, Ser. No. 303,309
Int. Cl.³ F04G *15/04, 29/10*
U.S. Cl. 418—186 **5 Claims**



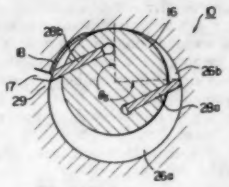
1. A hydraulic servomechanism of the type comprising a common casing enclosing a fluid distributor and a hydraulic motor having movable vanes and a rotary piston with a non-circular contour rotatably mounted in a cylindrical cavity into which said vanes project, these being held in contact with the lateral surface of said piston in order to define together with said lateral surface and said casing pressure chambers which communicate with said distributor, which further comprises fluid connecting means for connecting it to a fluid source and to a reservoir, an input shaft being coupled to said distributor and an output shaft being linked to said rotary piston, an elastic coupling means being arranged between said input shaft and said output shaft in order to define, in a rest position, a neutral relative angular position between said shafts, characterized in that said distributor comprises a valve spool slidably mounted in a transverse bore formed in said rotating piston and being adapted to become displaced in said bore under the control of said input shaft, the valve spool includes at least two recesses at its outer surface, each defining, together with shoulders in said bore, two fluid flow paths of variable section communicating respectively with said fluid source and said reservoir, conduits are formed in said rotary piston for providing fluid communication between each one of said recesses and selected regions of said lateral surface of said rotary piston, for supplying fluid to said pressure chambers, an operating pin is eccentric and rigidly fixed to said input shaft and movable in a cavity of said rotary piston, said operating pin is in engagement with said spool for operating it, the axial ends of said spool are adjacent two opposing chambers, respectively, in communication with said fluid source, said cavity communicating with said reservoir and said recesses of said spool are formed longitudinally, respectively between each chamber and said cavity in order to define together with said shoulders said fluid flow paths of variable sections.

4,413,963

SELF-CONTROLLABLE CAPACITY COMPRESSOR

Teruo Maruyama, Neyagawa; Shinya Yamauchi, Katano, and Yoshikazu Abe, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 22, 1982, Ser. No. 341,608
Claims priority, application Japan, Jan. 29, 1981, 56-12427
Int. Cl.³ F04C *29/08*
U.S. Cl. 418—259 **3 Claims**



1. In a compressor including a rotor having vanes slidably fitted thereto, a cylinder for receiving said rotor and vanes, side plates rigid on both sides of said cylinder and enclosing a space of each vane chamber defined by said vanes, rotor and cylinder at the sides thereof, and inlet and outlet ports each serving as a passage to communicate said vane chamber with the exterior, wherein said cylinder is oriented to have its top portion where a distance between the outer periphery of said rotor and the inner periphery of said cylinder becomes minimum, the improvement characterized in that said inlet port is positioned so as to make $a(\theta)$ almost constant, or meet $a(\theta)=a$, in a range of $\frac{1}{2}\theta_s<\theta\leqq\theta_s$and parameters of said compressor are determined to meet the following relation;

$$0.025<\theta_s a/V_O<0.080$$

where,

θ(radian): angle from the top portion of the cylinder to the leading end of the vane, which is held in contact with the inner periphery of the cylinder, around the center of revolution of the rotor,

θ_s(radian): angle θ at the completion of a suction stroke,

V_O(cc): volume of the vane chamber when θ undergoes θ_s, and

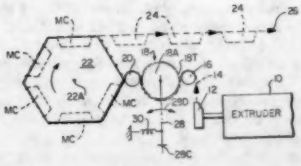
$a(\theta)$(cm²): effective area of suction passage from an evaporator to the vane chamber.

4,413,964

APPARATUS FOR THE CONTINUOUS FORMATION OF BI-AXIALLY ORIENTED THERMOPLASTIC MATERIALS

Thomas W. Winstead, Baltimore, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.

Division of Ser. No. 886,160, Mar. 13, 1978, Pat. No. 4,250,129.
This application May 29, 1980, Ser. No. 154,369
Int. Cl.³ B29D *7/02*
U.S. Cl. 425—66 **30 Claims**



1. An apparatus for continuously manufacturing oriented

thermoplastic molded articles from granulated and comminuted polystyrene material comprising:

extruder means for assimilating raw thermoplastic material and extruding it into a strip;

charging means for providing granulated and comminuted thermoplastic material to said extruder means;

regulating means controlling the temperature of said extruded strip to a desired optimum orientation temperature;

orientation means including input and output roller means for longitudinally advancing said strip and divergent rotary blade means intermediate said input and output roller means for imparting transverse stretch to said strip;

said input and output roller means and said divergent blade means having selected differential peripheral speeds therebetween to longitudinally stretch said strip to thereby biaxially orient said strip in conjunction with said divergent blade means;

polygonal rotary mold means having a mold cavity in each peripheral segment thereof;

said periphery of said mold means being juxtaposed with said output roller means;

said output roller means being constrained to closely follow said periphery of said mold means;

means continuously constraining said strip into the shape of said mold cavities while fixing said strip in its biaxially oriented state;

means continuously stripping the now fixed molded products and selvage from said mold means and separating said products from said selvage; and

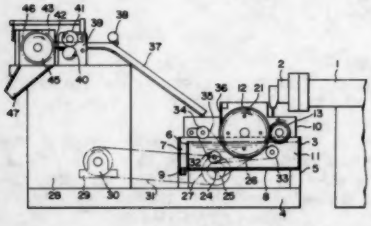
means continuously comminuting and recycling said selvage into said extruder means through said charging means, wherein the orientation means, divergent rotating blade means and polygonal rotary mold cooperate so that the stress placed in the polystyrene material by said biaxial orientation is substantially maintained from the initiation of said orientation to the forming of the molded articles therein.

4,413,965

PELLETIZING DEVICE FOR PLASTIC MATERIAL

Tomoo Kinoshita, and Minoru Hinuma, both of Tokyo, Japan, assignors to Nihon Repromachine Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 27, 1982, Ser. No. 382,610
Claims priority, application Japan, May 8, 1981, 56-68294
Int. Cl.³ B29C *25/00*
U.S. Cl. 425—71 **1 Claim**



1. A pelletizing device for plastic material comprising:

a T-die for extruding said plastic material into a sheet;

a cooling water tank disposed beneath said T-die;

a cooling roll having a plurality of first annular projections and first annular grooves formed in a surface portion of said roll for forming a corresponding profile of second projections and second grooves in said sheet of said plastic material, said cooling roll being partially submerged in said cooling water tank;

a pinch roll disposed adjacent to and coacting with said cooling roll to form said sheet;

a guide belt containing a lower surface portion of said cooling roll for transferring said sheet of said plastic material from said T-die, between said T-die, between said cooling roll and said pitch roll and away from said cooling roll;

a guide flume having an entrance and an exit and being disposed adjacent to an upper surface portion of said guide belt such that said entrance receives said sheet material from said cooling roll;

a fixed knife blade disposed above said exit of said guide flume and having a plurality of third grooves formed therein such that second projections formed in said sheet of said plastic material in said guide flume are positioned so as to correspond to said third grooves; and

a rotary knife having a plurality of blades connected thereto at predetermined intervals and wherein said rotary knife is juxtaposed with said fixed knife blade,

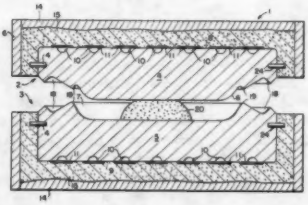
whereby the coaction of said fixed knife blade and said rotary knife breaks said sheet along said grooves to form strips, and cuts said strips.

4,413,966

FLUID-RELEASE MOLD AND THE METHOD OF MANUFACTURING THE SAME

Walter H. Mills, and Joseph T. Bilbrey, Sr., both of Springfield, Ohio, assignors to Wallace Murray Corporation, New York, N.Y.

Filed Jun. 26, 1981, Ser. No. 277,673
Int. Cl.³ B28B *21/36, 1/00, 1/26;* B29C *1/02*
U.S. Cl. 425—84 **25 Claims**



1. A fluid-release mold comprising:

a preformed, porous mold body having a mold face formed on a first exterior surface and a second surface;

at least one narrow groove formed in said second surface;

tape covering said groove and attached to said second surface to form a conduit between the surface of said groove and the surface of said tape facing said groove for directing pressurized release fluid to said mold; and

a fluid-impermeable backing material disposed over said second surface of said mold body to direct the egress of fluid from said conduit through said mold body in a direction away from said second surface.

13. A method of manufacturing a fluid-release mold comprising the steps of:

providing a preformed, porous mold body having a first exterior surface and a second surface;

forming a groove in said second surface;

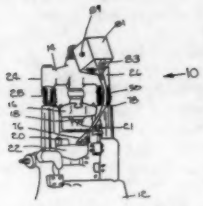
covering said groove with a cover material to form a conduit between the surface of said groove and said cover material for directing release fluid to said mold body; and

covering said mold body with a fluid-impermeable backing material whereby egress of fluid from said conduit is prevented except through the mold body in a direction away from said second surface.

4,413,967
APPARATUS FOR PRODUCING UNIFORM DENSITY AND WEIGHT BRIQUETTES

Stephen W. Burry, Geneva, Ind., assignor to CTS Corporation, Elkhart, Ind.

Division of Ser. No. 156,387, Jun. 4, 1980, Pat. No. 4,376,085.
This application Sep. 7, 1982, Ser. No. 415,358
Int. Cl.³ B28B 17/00
U.S. Cl. 425—149 8 Claims



1. An apparatus for controlling compacting force during compacting cycles to effect substantially constant density, size and weight briquettes from loose particles, comprising a variable size mold cavity, means for receiving a quantity of loose particles and adapted to be superimposed over the mold cavity prior to its expansion to an initial charge size whereby the loose particles are drawn into the expanding mold cavity to effect a void-free charge condition thereof, means for compacting the loose particles into a briquette, means for thereafter ejecting the briquette, and a closed-loop feedback control network for effecting the substantially constant density, size and weight briquettes and comprising means for detecting the peak compacting force during the compacting cycle to determine a peak compacting force value effected during the compacting cycle and during succeeding compacting cycles, means for comparing the peak compacting force value with a predetermined standard compacting force value corresponding to a standard density, size and weight briquette, means for detecting the deviation of the peak compacting force value from the predetermined compacting force value, and means for adjusting said variable size mold cavity in accordance with the deviation of the peak compacting force value from the predetermined standard compacting force value to effect selectively either an enlargement or a reduction in cavity size to effect successive compacting cycles each producing substantially the predetermined standard compacting force value productive of the substantially constant density, size and weight briquettes.

4,413,968
EXTRUSION DIE METERING DEVICE

William R. Bliss, Wilmington, Del., assignor to Thiokol Corporation, Chicago, Ill.

Filed Mar. 11, 1982, Ser. No. 357,224
Int. Cl.³ B29F 3/06
U.S. Cl. 425—198 23 Claims

1. An extrusion die for producing elongated products having longitudinally co-extending perforations, said perforations arranged in predetermined, varying patterns comprising

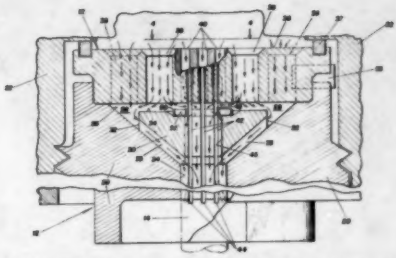
(a) a body having a central bore and an open chamber communicating with said bore;

(b) cover means for said chamber having at least one aperture for passage of extrusion product into said chamber;

(c) means in said body for regulating the flow of said product in said chamber including means for diverting a portion of said product and defining a passageway for said diverted portion to flow to said bore and means defining a passageway for the remaining product in said chamber to flow to said bore, said diverted flow passageway being relatively more circuitous than said remaining product passageway;

(d) means in said body for forming said perforations in said patterns in said product; and

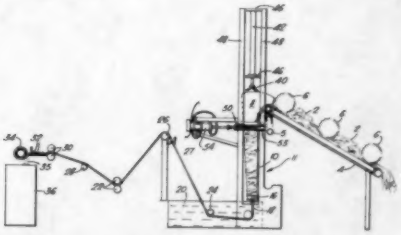
(e) a selected one of a variety of means positionable in cooperating relationship with said regulating means for metering the flow of said product in said body for effecting an adjustment in the distribution of product in said chamber and thereby forcing a positional adjustment of said perforation forming means in said bore to provide a selected one of said predetermined, varying perforation patterns.



4,413,969
METHOD AND APPARATUS FOR RE-CYCLING PLASTICS WASTE

William J. McDonald, Helen's Bay, Northern Ireland, assignor to James Mackie & Sons Limited, Belfast, Northern Ireland

Filed Dec. 10, 1981, Ser. No. 329,332
Claims priority, application United Kingdom, Dec. 16, 1980, 8040298
Int. Cl.³ B29F 3/08; C08J 11/00
U.S. Cl. 425—217 6 Claims

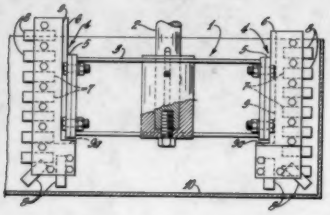


1. Apparatus for re-claiming resilient thermoplastics material comprising an extruder having an inlet, a plunger, a heater to melt said thermoplastics material and an outlet, means for reciprocating said plunger in relation to said inlet to said extruder whereby to compress thermoplastic material into said extruder, a feeding device for said thermoplastic material, means for intermittently operating said feeding device in synchronism with said plunger to feed material to said inlet to said extruder prior to each compressive stroke of said plunger, a restraining member comprising an assembly of spaced tines for holding said resilient material in said inlet of said extruder in a compressed condition and means for operating said restraining member in synchronism with said plunger, whereby said member is moved to its restraining position at approximately the end of each compressive stroke of said plunger and is withdrawn again before the end of the next compressive stroke of said plunger.

4,413,970
ROTARY SCRAPERS

Stephen Seng, Frazeysburg, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Feb. 27, 1981, Ser. No. 238,884
Int. Cl.³ B22F 3/00
U.S. Cl. 425—222 3 Claims



1. In a pelletizer for converting particulate material into pellets, having a need to remove build-up of said material from the inside walls of said pelletizer, the improvement comprising:

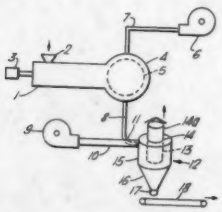
(a) a rotatable scrapper support;

(b) a blade carrier afixed to said support, said carrier being adapted with a plurality of ports for the positioning of a plurality of scraper blades therein, at least one of said scraper blades extending horizontally from one of said ports and at least one of said scraper blades extending angularly from another of said ports.

4,413,971
RUBBER RECOVERY APPARATUS

James S. Nettleton, Sarnia, Canada, assignor to Polysar Limited, Sarnia, Canada

Filed May 11, 1982, Ser. No. 377,265
Claims priority, application Canada, Jun. 22, 1981, 380339
Int. Cl.³ A01J 21/02
U.S. Cl. 425—311 8 Claims



1. An improved apparatus for the recovery of dry polymer in porous crumb form which comprises in combination:

(a) an extrusion device which terminates in a die means, said die means comprising a pair of generally cylindrical concentric plates each having a plurality of spaced apart extrusion orifices through which polymer is extruded, the downstream-most plate being rotatably mounted with respect to the upstream-most plate, said upstream-most plate presenting a concave surface in the downstream direction, said downstream-most plate being co-axial with and in mating nesting engagement with a generally concave surface of said upstream-most plate,

(b) cutter means having a generally cylindrical body mounted for rotation about its longitudinal axis and being co-axial with and closely spaced from and within said pair of concentric plates, said cutter means being equipped with a plurality of spaced apart blades which project radially from and extend in a helical manner longitudinally along said body, said blades having at their free ends a cutting edge which is closed spaced adjacent to the downstream side of said downstream-most plate,

(c) first gas compressing means capable of supplying compressed gas at a pressure of from about 7 to about 15 psig and at a linear velocity of from about 75 to about 150 feet per second to said concentric plates to cause gas to flow over said plates and longitudinally over said cutter means in a downstream direction whereby pellets of polymer formed therein are flushed in a downstream direction,

(d) first pipe means for transferring said pellets of polymer in said compressed gas away from said cutter means,

(e) second gas compressing means capable of supplying compressed gas at a pressure of from about 0.07 to about 0.35 psig and at a linear velocity of from about 100 to about 150 feet per second,

(f) second pipe means having a cross-sectional area of from about 4 to about 8 times the cross-sectional area of said first pipe means and connected at one end to said second has compressing means,

(g) said first pipe means being joined into said second pipe means and terminating within said second pipe means in a downstream direction thereof, both said first and said second pipe means terminating at a point closely adjacent to and downstream of the junction thereof and forming the entry to a cyclone separator, said entry being tangential to the circumference of the upper portion of the cylindrical section of said cyclone separator,

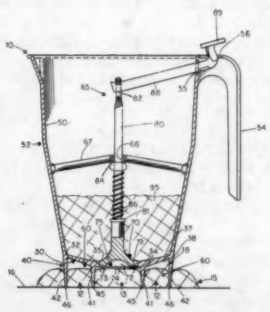
(h) said cyclone separator comprising an upper cylindrical section and attached thereto a lower inverted truncated conical section, said upper cylindrical section having on its topmost closed end a re-entrant exit port for gas and said lower inverted truncated conical section having at its lowest end a lower exit port for porous polymer crumb, and

(i) conveying means for conveying said porous polymer crumb from said lower exit port of said cyclone separator, optionally to further vapor removal/cooling means, to weighing and packaging means.

4,413,972
DEVICE FOR USE IN MAKING DOUGHNUTS

Richard L. Lawson, 3272 N. Greenwood, Sanger, Calif. 93657

Filed Jan. 22, 1982, Ser. No. 341,690
Int. Cl.³ A21C 5/00, 11/12
U.S. Cl. 425—290 8 Claims



1. A device for use in making doughnuts and the like from a flowable dough disposed on a substantially horizontal upwardly disposed surface comprising a container for such dough having a bottom wall defining an opening centrally thereof; valve means for selectively opening and closing the opening to regulate a gravitational flow of dough therethrough to form a layer of such dough on said surface; a first blade-like ring extended downwardly from the wall in circumscribing relation to the opening; and a second blade-like ring extended

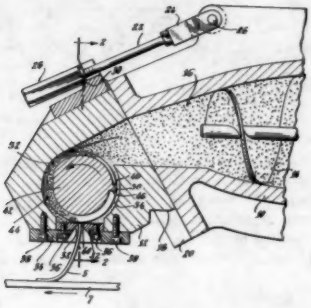
downwardly from the wall in circumscribing spaced relation to the first ring, so that pressing the rings into such layer cuts a doughnut therefrom between the rings, said valve means being such as to seat against an upper surface of said bottom wall and leaving unobstructed the space inside said first ring.

4,413,973

EXTRUSION DIE

Alan R. Peters, Stratford, Conn., assignor to Automation International Corp., Norwalk, Conn.

Filed Jun. 24, 1981, Ser. No. 275,210
Int. Cl.³ B29F 3/04; B29D 7/02
U.S. Cl. 425—461 **20 Claims**



1. Apparatus for extruding material comprising

a die having an elongated aperture,

a roll juxtaposed to said aperture in closely spaced-apart relationship thereto with the axis of said roll substantially parallel to the long axis of said aperture, said roll having at least one depression in the surface thereof, at least one edge of which is a generally axially oriented leading edge and forms an abrupt ridge with respect to the surface of said roll, the depth of said depression with respect to the circumference of said roll being greater at each point along said leading edge than at the circumferentially corresponding point on the opposite trailing edge of said depression,

means for applying pressure to extrudable material to cause it to move past said roll and through said aperture,

and means to rotate said roll in the direction such that as said depression moves past said aperture, said leading edge passes said aperture before said trailing edge.

4,413,974

APPARATUS FOR MAKING A MULTI-LAYERED BLOWN PLASTIC CONTAINER

Robert F. Kontz, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 303,759, Sep. 21, 1981, Pat. No. 4,364,896.
This application May 21, 1982, Ser. No. 380,580
Int. Cl.³ B29C 17/07; B29D 9/00
U.S. Cl. 425—523 **2 Claims**

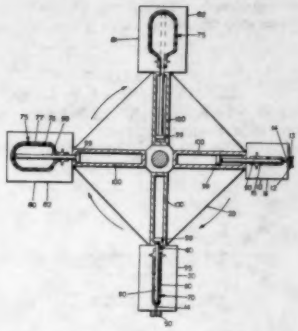
1. An apparatus for blow molding an oriented multi-layered hollow plastic container comprising:

A. a first station having pin means including a core pin and having injection molding means for forming a first thermoplastic parison about the core pin,

B. a second station including the pin means in which the core pin serves as a stretch pin for stretching the first parison axially and a second injection molding means for injection molding a second thermoplastic parison around the first stretched parison on the stretch pin to provide a two-layer parison,

C. a third station including means for blow molding the two-layer parison at its orientation temperature to form a blown container, the pin means being a blow pin at the third station; and

D. a fourth station including means for ejecting the finished blown container,



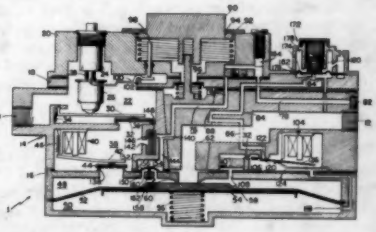
the pin means being so constructed and arranged that the core pin transports the first parison, the stretched two-layer parison, and the blown container to the second, third and fourth stations.

4,413,975

COMBINATION CONTROL WITH HIGH/LOW PILOT GAS FLOW

Jesse H. Turner, Auburn, and Elmer E. Wallace, Fort Wayne, both of Ind., assignors to Essex Group, Inc., Fort Wayne, Ind.

Filed Apr. 9, 1982, Ser. No. 366,957
Int. Cl.³ F23Q 9/08
U.S. Cl. 431—56 **4 Claims**



1. In a combination control including a housing having a gas inlet, a main burner gas outlet, a pilot burner gas outlet, a first flow passage including first and second serially connected chambers interconnecting said gas inlet to said main burner gas outlet, and a second flow passage interconnecting said first chamber to said pilot burner gas outlet; a thermostatically controlled redundant valve in said first flow passage between said first and second chambers; a differential pressure operated main valve in said first flow passage between said second chamber and said main burner gas outlet; and adjustable flow restrictor means in said second flow passage for adjusting a high pilot supply of gas therethrough to produce a pilot burner flame of a selected large ignition size for ignition purposes; the improvement comprising: parallel first and second inlet branch passageways in said second flow passage upstream of said pilot flow adjustment means; said first inlet branch passageway communicating with said first chamber and including flow restriction means for supplying a restricted low pilot supply of gas to said pilot burner gas outlet to produce a pilot burner flame of a small standby size when said redundant valve is closed; said second inlet branch passageway communicating

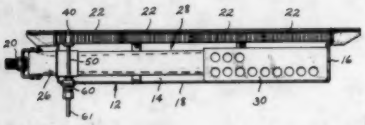
with said second chamber and bypassing said first inlet branch passageway for supplying an increased high pilot supply of gas to said pilot burner gas outlet to produce a pilot burner flame of a large ignition size when said redundant valve is open; and check valve means in said second inlet branch passageway for blocking gas flow from said first inlet branch passageway to said second chamber through said second inlet branch passageway when said redundant valve is closed.

4,413,976

IGNITER FOR A GAS BURNER

Richard M. Scherer, Niles, Mich., assignor to Southbend Escan Corporation, South Bend, Ind.

Filed May 15, 1981, Ser. No. 264,111
Int. Cl.³ F23D *13/12*
U.S. Cl. 431—278 **2 Claims**



1. A gas burner including tile having inner and outer surfaces with multiple openings extending through the tile from the inner to the outer surfaces thereof, a housing associated with said tile and defining a chamber with said tile inner surface forming one wall of said housing chamber, means for introducing gas into said housing chamber, and means for igniting said gas to produce radiant heat at said tile outer surface, the improvement wherein said gas igniting means includes a nozzle secured within one of said openings, tube means adapted for connection at one end to a gas source extending within said housing chamber and seated at its other end in said nozzle for supplying gas to a pilot flame at said tile outer surface, said tube means as it extends into said housing chamber including heat expandable bellows parts to accommodate heat expansion of the tube means within said housing chamber during burner usage for the purpose of maintaining the seat of said tube means other end in said nozzle, whereby gas introduced into said housing chamber will be ignited at said tile outer surface.

4,413,977

APPARATUS FOR TAKING MATERIAL TO BE TREATED INTO AND OUT OF HIGH PRESSURE TANK

Motoharu Takano, Machida, and Minoru Hoshino, Kawaguchi, both of Japan, assignors to Q.P. Corporation, Tokyo, Japan

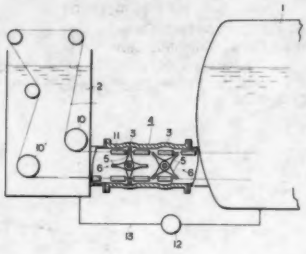
Filed Dec. 8, 1981, Ser. No. 328,693
Claims priority, application Japan, Jan. 9, 1981, 56-1892; May 13, 1981, 56-71885
Int. Cl.³ F27D *19/00*; A45B *9/00*
U.S. Cl. 432—56 **4 Claims**

1. An apparatus for taking a material to be treated into and out of a treating high pressure tank, comprising:

wall means defining a conveyor passage connecting an end of a high-pressure treating tank containing a treating liquid and a portion of water tank below the water level in said water tank, said conveyor passage being composed of a plurality of cylindrical casings arranged in a side-by-side relation with the axes of said casings extending widthwise of said passage;

a rotary closure member having two or more blades accommodated rotatably within each casing coaxial therewith, the length of each blade measured from the axis being generally equal to the radius of the casing such that each blade make a sliding contact with the inner surface of the associated casing, said rotary closure members being adapted to rotate in the same direction, the blades of adjacent rotary closure members being arranged at a phase difference of 180/n° (n being number of blades of each rotary closure member) so that said conveyor passage is always closed by some of said blades of rotary closure members;

a pair of conveyor chains carrying a plurality of treating vessels at a constant pitch and disposed along both side surfaces of said conveyor passages to run through said



high pressure tank and said water tank in timed relation to the rotation of said rotary closure members so that said vessels pass between said rotating blades in each casing and between adjacent casings; and

means mounted in said water tank to return leaked treating liquid from said water tank to said high pressure tank.

4,413,978

ORTHODONTIC RETAINER

Craven H. Kurz, No. 6 North Star, Apt. 106, Marina del Rey, Calif. 90291

Filed May 17, 1982, Ser. No. 379,051
Int. Cl.³ A61C *7/00*
U.S. Cl. 433—6 **3 Claims**

1. A retainer assembly for use in conjunction with the teeth of an arch of a patient, said assembly comprising: a first metallic arcuate band configured to conform with the lingual surface of the teeth of the arch extending around the lingual side of the arch to be cemented to the lingual side of the arch so as to hold the teeth in particular post-orthodontic treatment positions; a second transparent removable plastic arcuate band separate from the first band and configured to conform with the labial surfaces of the teeth of the arch and extending around the labial side of the arch also serving to hold the teeth of the arch in their post-orthodontic treatment positions, posts mounted at the respective ends of each of said first and second arcuate bands; and elastic ligatures extending around respective pairs of said posts resiliently to secure said arcuate bands to one another.

4,413,979
PREFORM FOR MOLDING CUSTOM DENTAL IMPRESSION TRAYS

Stephen J. Ginsburg, Ann Arbor, and Frederick E. Draheim, Milford, both of Mich., assignors to Black Knight Investments Limited, Georgetown, Cayman Islands

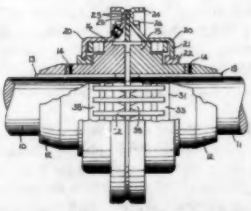
Filed Apr. 19, 1979, Ser. No. 31,665
Int. Cl.[3] A61C 9/00
U.S. Cl. 433—41 10 Claims

1. A dental tray for use in taking a dental impression comprising a thin planar sheet, said sheet being constructed of a material which is rigid at mouth temperature but which is pliant when heated to a predetermined temperature, and a handle protruding outwardly from one end of the sheet, wherein said dental tray is of a one-piece construction and includes a first elongated side and a second opposing, elongated side, said first and second sides extending asymmetrically from said handle, whereby said tray is reversible and can be used in taking a dental impression on all four quadrants of a human dentition.

4,413,980
FLEXIBLE GRID COUPLING

Richard G. Walloch, Muskego, Wis., assignor to The Falk Corporation, Milwaukee, Wis.

Filed Feb. 24, 1981, Ser. No. 237,843
Int. Cl.[3] F16D 3/50, 3/56
U.S. Cl. 464—82 4 Claims



1. In a flexible coupling including a pair of hubs each having a plurality of axially extending teeth whose adjacent side faces define slots therebetween, and a grid joining the hubs, the improvement wherein:

the grid includes a plurality of straight metal rungs received in the slots and spanning the space between the hubs, the ends of said rungs extending axially beyond the teeth of the pair of hubs, and elastomer members joining together the ends of the rungs to form a unitary structure with said rungs.

4,413,981
SHEAVE

Eugene F. White, and Frances H. White, both of Rte. 4, Box 118, both of Monroe, N.C. 28110

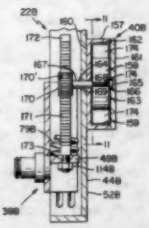
Filed Jun. 12, 1981, Ser. No. 273,248
Int. Cl.[3] F16H 55/36, 7/22, 55/40, 55/44
U.S. Cl. 474—94 8 Claims

4. A strand engaging sheave comprising a hub, an annular body formed of a soft elastomer and defining a sheave axis, said body having outwardly diverging sidewall portions defining between opposing inner surfaces a circumferential strand receiving groove of predetermined radial depth and having a plurality of strand gripping abutments projecting inwardly into said groove from opposing sidewall surfaces, each said abutment having a predetermined circumferential dimension, adjacent ones of said abutments projecting inwardly from alternate ones of said opposing sidewall surfaces and being spaced circumferentially one from another at a predetermined circumferential distance, each said abutment having a predetermined radial dimension less than said radial depth and an arced, planar abutment surface facing an opposing sidewall surface which abutment surface is arcuate about a center spaced further said opposing sidewall surface than from the sidewall surface from which said abutment projects and defines a planar radial wall lying on a plane including said sheave axis, said abutment surfaces of adjacent abutments defining a tortuous cusp-like strand engaging zone for positively gripping a strand received within said groove, said sheave further comprising a plurality of resilient spoke members extending generally tangentially of said hub for compression and tension loading upon gripping engagement of said body with a strand.

4,413,982
BELT TENSIONER, PART THEREFOR AND METHODS OF MAKING THE SAME

Randy C. Foster, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed Sep. 11, 1981, Ser. No. 301,351
Int. Cl.[3] F16H 7/12
U.S. Cl. 474—138 6 Claims



1. In a tensioner for a power transmission belt that is adapted

to be operated in an endless path, said tensioner comprising a support means for being fixed relative to said belt, a belt engaging means carried by said support means and being movable relative thereto, mechanical spring means operatively associated with said support means and said belt engaging means for urging said belt engaging means relative to said support means and against said belt with a force to tension said belt, and fluid dampening means operatively associated with said support means and said belt engaging means to dampen the movement of said belt engaging means relative to said support means in at least one direction of movement thereof, the improvement wherein said mechanical spring means comprises a pair of springs disposed in substantially parallel spaced relation and said fluid dampening means has at least a part thereof disposed between said springs and in substantially parallel relation therewith, said fluid dampening means comprising a rotary dampening means.

4,413,983

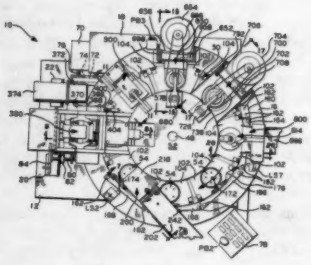
APPARATUS FOR ASSEMBLING RING-TYPE CLOSURES

Jerry W. Young, Weston; William R. Eddy, and Raymond C. Taylor, both of Kansas City, all of Mo., assignors to Sealright Co., Inc., Kansas City, Mo.

Continuation of Ser. No. 55,234, Jul. 6, 1979, abandoned. This application Apr. 1, 1981, Ser. No. 311,353

Int. Cl.³ B31B *17/02*

U.S. Cl. 493—30 **46 Claims**



1. Apparatus for assembling closures, each including a generally cylindrical ring, having a generally cylindrical outer surface and generally circular open ends, and a generally circular disc, said apparatus comprising:

a plate having an upper surface and a lower surface and a plurality of ring receiving means on said upper surface each adapted for receiving one of said generally cylindrical rings thereon;

plate drive means operatively related to said plate for rotating said plate about an axis of rotation;

ring feed means positioned adjacent said plate for positioning one of said rings on a first one of said ring receiving means;

disc feed means positioned adjacent said plate for positioning one of said generally circular discs within one of said open ends of one of said generally cylindrical rings on a second one of said ring receiving means;

adhesive dispensing means positioned adjacent said plate for dispensing a quantity of adhesive at at least one location within one of said open ends of one of said rings on a third one of said ring receiving means;

lubricant dispensing means positioned adjacent said plate for dispensing a quantity of lubricant on at least one of said rings;

curling means positioned adjacent said plate for mutually curling one of said open circular ends of one of said rings and a respective one of said discs positioned therewithin into mutual engagement on a fourth one of said ring receiving means so as to thereby close one circular end of said ring and form a ring-type closure;

grooving means positioned adjacent said plate for forming a generally circumferential groove in the generally cylindrical outer surface of a generally cylindrical ring of a ring-type closure on a fifth one of said ring receiving means; and

ejecting means positioned adjacent said plate for ejecting a ring-type closure from a sixth one of said ring receiving means.

4,413,984

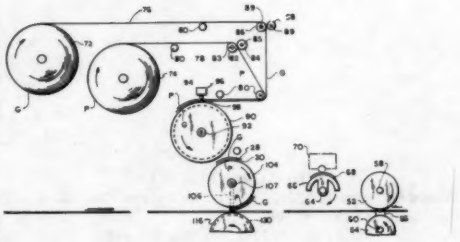
METHOD AND APPARATUS FOR MAKING WINDOW ENVELOPES

Seymour S. Alter, Great Neck, N.Y., assignor to New York Envelope Corp., Long Island City, N.Y.

Filed May 1, 1981, Ser. No. 259,676

Int. Cl.³ B31B *1/82*

U.S. Cl. 493—222 **14 Claims**



1. A method for manufacturing a window envelope comprising the steps of:

providing an envelope blank having an opening cut therein;

providing a first rotatable cylinder having suction means capable of holding a sheet of material at its surface;

providing a second rotatable cylinder having suction means capable of holding a sheet of material at its surface, said second cylinder having a surface portion in proximity to said first cylinder;

feeding at least two overlapped sheets to said first cylinder, at least one of said sheets being able to transmit light;

rotating said first cylinder while said suction means holds said overlapped sheets to the surface thereof;

de-actuating said suction means of said first cylinder when said sheets are rotated to a point where they are in proximity to said second cylinder, said suction means of said second cylinder causing said sheets to be transferred thereto;

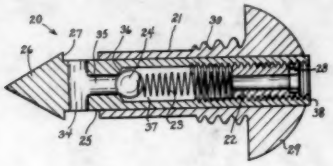
rotating said second cylinder so that said sheets are positioned in proximity to the envelope blank; and

transferring said sheets to said envelope blank from said second cylinder such that the light transmitting sheet directly overlies said opening and said other sheet is positioned behind said light transmitting sheet.

4,413,985
HYDROCEPHALIC ANTENATAL VENT FOR INTRAUTERINE TREATMENT (HAVIT)

Edward Wellner, Fairfax, Va.; Maria Michejda, Rockville, and Gary D. Hodgen, Potomac, both of Md., assignors to The United States of America as represented by the Dept. of Health & Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 298,773, Sep. 2, 1981, abandoned. This application Nov. 30, 1981, Ser. No. 325,730
Int. Cl.³ A61M 27/00
U.S. Cl. 604—9 15 Claims



15. A drainage valve for in utero relief of pressure from hydrocephalic fluid in the cranial cavity of a fetus, comprising:

a hollow valve element including means, at one end, for penetrating said cranial cavity in utero, said valve element having an intake port adjacent said penetrating means and containing means for blocking flow of said fluid into said intake port and means for biasing said blocking means into blocking position;

and means, adjustably positioned on said valve element, for securing said valve element in an implanted position at said cranial cavity,

wherein when pressure in said cranial cavity exceeds a predetermined amount, the force of said cavity pressure overcomes the force of the biasing means, said blocking means is moved to an unblocking position and said fluid flows into said intake port, through said valve element and out of the cranial cavity into the uterus.

4,413,986
TAMPON ASSEMBLY WITH MEANS FOR STERILE INSERTION

Henry R. Jacobs, 525 Grove St., Evanston, Ill. 60201

Filed Nov. 10, 1980, Ser. No. 205,678
Int. Cl.³ A61F 15/00
U.S. Cl. 604—14 8 Claims

1. A vaginal tampon assembly comprising:

a tampon of absorbent material for insertion into the vagina and having withdrawal means,

a semirigid first tube containing said tampon,

ejector means to push said tampon from said first tube into the vagina,

a semirigid second tube having an inside diameter substantially the same as the outside diameter of said first tube, said second tube disposed in telescoping relationship around said first tube, said second tube having means for preventing its insertion into the vagina when placed against the introitus of the vagina,

a flexible sheath having an outer end secured to the inner end of said second tube and folded into the inner end of said first tube, whereby said tampon may be inserted into the vagina in a sterile manner by placing said inner end of said second tube against the introitus, plunging said first tube inward of said second tube to extend an inner portion thereof into the vagina while extending said flexible sheath therearound, and actuating said ejector means to push said tampon from the inner end of said first tube.

4,413,987
WOUND IRRIGATION SYSTEM

Nathan H. Schwartz, P.O. Box 1643, Smyrna, Ga. 30081

Filed Feb. 2, 1982, Ser. No. 345,003
Int. Cl.³ A61M 1/00
U.S. Cl. 604—28 6 Claims

1. A method of irrigating a wound in a body part with a treatment liquid comprising the steps of:

placing a piece of tubing having a perforated section therein in the body part so that the perforated section is generally straight and located in the vicinity of the wound in the body part to be irrigated and opposite ends of the tubing extend exteriorly of the body part;

connecting one end of the tubing to a source of the treatment liquid;

connecting the opposite end of the piece of tubing to a vacuum pump;

operating the source of treatment liquid so that the treatment liquid continuously passes along the tubing toward the perforated section so that some of the treatment liquid passes into the wound through the perforated section; and

operating the vacuum pump to impose a vacuum in the tubing and withdraw liquid from the wound through the perforated section while at the same time withdrawing treatment fluid past the perforated section without passing into the wound to keep the passage through the tubing from becoming blocked.

4,413,988
SHORT-TUBING SET GRAVITY POWERED PERITONEAL CYCLER

Alan E. Handt, 705 Pineview, Zionsville, Ind. 46077, and Stephen R. Ash, 2500 N. 400 East, Lafayette, Ind. 47905

Filed Apr. 28, 1982, Ser. No. 372,457
Int. Cl.³ A61M 5/00
U.S. Cl. 604—29 16 Claims

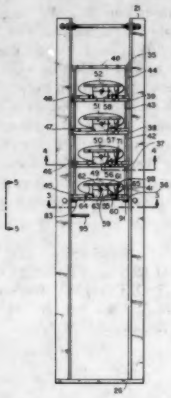
13. A short tube set gravity powered peritoneal cycler for operation with full bags of fluid comprising:

main frame means;

a plurality of trays each sized to support a full bag of fluid;

vertical frame means slidably mounted in said main frame means and having mounting planes each receiving one of said trays and spacing said trays apart a distance at least equal to a full bag thickness;

a movable holder on said main frame means to alternately



hold a particular tray as said vertical frame means moves downwardly decreasing said distance between said particular tray and the tray thereabove and then holding said vertical frame means as said particular tray falls away from said vertical frame means until said distance is once again attained.

4,413,989

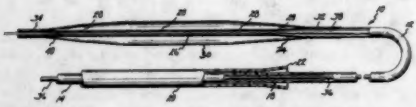
EXPANDABLE OCCLUSION APPARATUS

Gilmore T. Schjeldahl, Minnetonka, Minn., and B. Sharma, Springfield, Ill., assignors to Angiomedics Corporation, Minneapolis, Minn.

Continuation-in-part of Ser. No. 185,273, Sep. 8, 1980, abandoned, which is a continuation-in-part of Ser. No. 47,353, Jun. 11, 1979, abandoned. This application Aug. 17, 1981, Ser. No. 293,466

Int. Cl.³ A61M *25/00*

U.S. Cl. 604—96 **33 Claims**



1. A catheter attachment for facilitating coronary transluminal angioplasty/coronary perfusion procedures, comprising:

(a) an elongated outer tubular member having at least one perforation proximate the distal end thereof;

(b) a generally non-elastic, hollow, expander member surrounding said outer tubular member proximate said distal end and sealingly connected to said outer tubular member at longitudinally spaced apart locations on either side of said perforation; and

(c) an elongated inner tubular member of a predetermined diameter less than the inner diameter of said outer tubular member and disposed within the lumen of said outer tubular member and extending from the proximal end thereof beyond the distal end thereof, the arrangement being such that a fluid introduced at said proximal end of said outer tubular member perfuses between said outer and inner tubular members, through said perforation to fill the volume of said expander member and out the distal end of said outer tubular member.

4,413,990

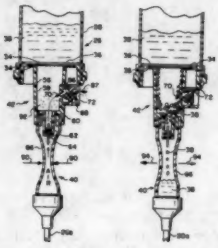
AIR BYPASS VALVE ASSEMBLY FOR A MEDICAL FLUID ADMINISTRATION SET

Herbert Mittleman, Deerfield, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Aug. 31, 1981, Ser. No. 298,234

Int. Cl.³ A61M *1/00*

U.S. Cl. 604—122 **8 Claims**



1. In a medical fluid administration set including a fluid pathway, a compressible drip chamber in the pathway and a membrane valve in the pathway preventing air from passing downstream through the membrane valve in the pathway, the improvement comprising:

air-venting bypass valve means mounted in the pathway intermediate the membrane valve and the drip chamber;

said bypass valve means operable in an unstressed, first mode wherein the pathway is closed at said bypass valve means to the atmosphere external to the pathway, and an air-expulsing, second mode upon compression of the drip chamber, wherein said bypass valve means automatically opens, permitting air in the drip chamber to exit the administration set through said bypass valve means;

said bypass valve means gradually returning to said unstressed, first mode in response to the decreasing force of the existing air, said bypass valve means relieving pressure upon the membrane valve by the air entrapped in the drip chamber during the compression thereof, said bypass valve means returning from said air-expulsing, second mode to said unstressed, first mode before the air pressure in the drip chamber drops to atmospheric pressure, thereby preventing an influx of air into the pathway through said bypass valve means.

4,413,991

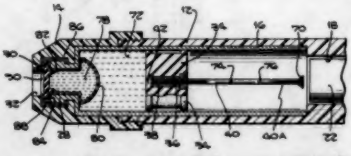
DUAL DOSE AMPULE

John B. Schmitz, 800 Fairview Ave., Arcadia, Calif. 91006, and William L. Schmitz, 43901 Citrus View Dr., Hemet, Calif. 92343

Filed Mar. 18, 1982, Ser. No. 359,222

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—191 **6 Claims**



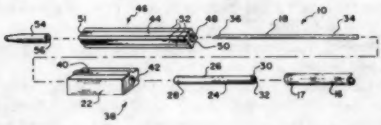
1. A dual dose liquid medicament device comprising:

a tubular chamber having rearward and forward ends,
a hypodermic needle supported in said chamber for forward movement therein between a rearward limit and a forward limit with the forward end of the needle extending from said chamber,
said hypodermic needle having a lumen with a forward outlet and with rearward inlet means,
a pair of separate liquid medicament compartments in said chamber,
means for flowing liquid medicaments from both compartments to said lumen inlet means,
a wall in said chamber pierceable by the hypodermic needle and dividing a portion of said chamber into said separate liquid medicament compartments,
said compartments being in tandem axially of said chamber,
and both compartments having pierceable walls other than said wall dividing a portion of said chamber in the said separate liquid medicament compartments,
and said hypodermic needle in its rearward limit of movement, having its forward end located rearwardly of both said compartments.

4,413,992
CANNULA SUPPORT ASSEMBLY AND ITS METHOD OF MANUFACTURE

Emil H. Soika, Mundelein, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Dec. 2, 1981, Ser. No. 326,739
Int. Cl.³ A61M 5/14
U.S. Cl. 604—263 **7 Claims**



1. An assembly attachable as a prefabricated unit to a fluid conduit and comprising
a cannula having an operative end,
a first separately fabricated component part comprising a first generally tubular member having an essentially uniform cross-sectional shape and a bore extending between opposite sides thereof,
a second separately fabricated component part comprising a second generally tubular member having an essentially uniform cross-sectional shape and including a main body portion inserted within said first tubular member bore to join said first and second parts together, said second tubular member further including first and second opposite end portions each outwardly exposed beyond respective opposite sides of said first tubular member when said main body portion is inserted in said first member bore and a bore which extends between said opposite end portions and into which said cannula is inserted with said operative end thereof supported in an outwardly exposed position beyond said first outwardly exposed opposite end portion of said second tubular member,
a third separately fabricated component part comprising a third generally tubular member having an essentially uniform cross-sectional shape and including an open interior having oppositely spaced end and an interior diameter which exceeds the exterior diameter of said operative cannula end, one of said ends being removably engaged about said first outwardly exposed opposite end portion of said second member to thereby join said second and third component parts together and to enclose said operative end of said cannula within said open interior,
a fourth separately fabricated component part comprising a fourth member inserted within the other one of said ends of said third tubular member to thereby join said third and fourth component parts together and to seal said other end of said open interior, and
said opposite end portion of said second member remaining outwardly exposed for attachment to the fluid conduit after said cannula and said first, second, third, and fourth component parts have been joined together to thereby enable the attachment of said assembly as a prefabricated unit to the fluid conduit.

4,413,993
INFILTRATION-PROOF INTRAVENOUS NEEDLE

Yolan R. Guttman, P.O. Box 304, Radio City Station, Bronx, N.Y. 10019

Continuation-in-part of Ser. No. 236,105, Feb. 19, 1981, abandoned, which is a continuation of Ser. No. 172,238, Jul. 25, 1980, abandoned, which is a continuation-in-part of Ser. No. 896,340, Apr. 14, 1978, abandoned, which is a continuation of Ser. No. 697,043, Jun. 17, 1976, abandoned, which is a continuation of Ser. No. 602,733, Aug. 7, 1975, abandoned, which is a continuation of Ser. No. 384,081, Jul. 30, 1973, abandoned, which is a continuation-in-part of Ser. No. 156,017, Jun. 23, 1971, abandoned, which is a continuation-in-part of Ser. No. 830,211, Apr. 7, 1969, abandoned, which is a continuation-in-part of Ser. No. 393,688, Sep. 1, 1964, abandoned, which is a continuation-in-part of Ser. No. 313,362, Oct. 2, 1963, abandoned. This application Oct. 26, 1981, Ser. No. 314,686
Int. Cl.³ A61M 5/32
U.S. Cl. 604—274 **3 Claims**

1. An intravenous needle for insertion into a vein to supply fluid thereto, said needle preventing infiltration of fluids into tissues surrounding said vein, said intravenous needle comprising a round elongated hollow needle shaft tapering to a completely round elongated tip terminating in a sharp point which exhibits a solid, imperforate circumferential surface, said point retaining a round cross section throughout, said point lying on the axis of the needle shaft and an opening of said needle shaft at a measured distance spaced from said point, said distance being sufficient to permit said opening to remain within the lumen of said vein even when the point of such an inserted needle penetrates the wall of the vein from inside out.

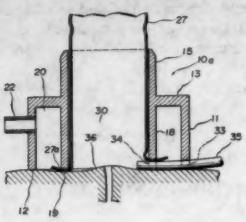
4,413,994
INTESTINAL IRRIGATOR FOR USE WITH ARTIFICIAL ANUS

Hiromi Sarashina, Sakura, Japan, assignor to Senko Medical Instrument Mfg. Co., Ltd., Tokyo, Japan

Filed Mar. 12, 1982, Ser. No. 357,741
Claims priority, application Japan, Mar. 18, 1981, 56-38004[U]
Int. Cl.³ A61F 5/44
U.S. Cl. 604—327 **5 Claims**

1. An intestinal irrigator adapted for use with an artificial anus which irrigator comprises:
(a) a body including a hollow portion having open front and rear ends, said hollow portion having a bag-mounting portion;
(b) a suction portion mounted around said hollow portion, said suction portion having an open front end, said open front end of said suction portion lying flush with said open front end of said hollow portion; and said suction portion having a suction port connectable to a suction source; and

(c) a liquid supply portion connected to said hollow portion, said liquid supply portion being connectable to a liquid



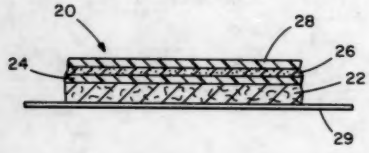
supply source for supplying a liquid to the interior of said hollow portion.

4,413,995

ABSORBENT PANEL SUITABLE FOR USE IN ABSORBENT PRODUCTS

Ralf Korpman, Bridgewater, N.J., assignor to Personal Products Company, Milltown, N.J.

Filed May 21, 1982, Ser. No. 380,646
Int. Cl.³ A61F *13/16*
U.S. Cl. 604—368 **17 Claims**



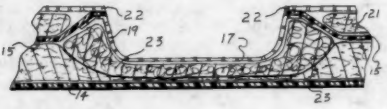
15. A tampon containing an absorbent core comprising a paper or fabric substrate coated on at least one surface with a reactive composition of from about 10 to about 40 parts by weight of a liquid polyhydroxy organic compound and from about 90 to about 60 parts by weight of a particulate water-insoluble, water-swellable absorbent polymer having a gel capacity of at least 10.

4,413,996

DIAPER WITH LIQUID RETAINING CHAMBER

Kevin D. Taylor, 1716 N. 1900 West, Ogden, Utah 84404

Filed Jul. 14, 1981, Ser. No. 283,291
Int. Cl.³ A41B *13/02*
U.S. Cl. 604—382 **4 Claims**



1. A diaper comprising:

a thin flexible, moisture impervious backing sheet;

a layer of porous fibrous material superimposed upon the backing sheet;

a thin flexible moisture impervious barrier sheet generally covering the fibrous layer and sealably secured around its periphery to the backing sheet, said barrier sheet having a port therethrough positioned to allow entry of liquid from the body of the infant into the fibrous layer, the layer of fibrous material being dished toward the backing sheet at the port through the barrier sheet, so as to form a well for receiving the liquid;

a thin flexible, water pervious well lining sheet covering the side and bottom portions of the well; and

a well surrounding layer of porous fibrous material interposed between the well lining sheet and the adjacent porous fibrous material of the layer, said well surrounding layer being substantially more porous than the material upon the backing sheet, so that the liquid entering the well is immediately collected thereby.

4,413,997

DICARBAMOYLSULFONATE TANNING AGENT

Brian Milligan, North Balwyn, Australia; Peter R. Buechler, Wyncote, and Stephen H. Feairheller, Wyndmoor, both of Pa., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Feb. 7, 1983, Ser. No. 464,530

Int. Cl.[3] C14C *3/06, 3/28, 3/08*

U.S. Cl. 8—94.21 11 Claims

1. A method of making leather comprising treating cattle hides and sheepskins to the tanning action of an aqueous solution of isophorone dicarbamoylsulfonate.

4,413,998

PROCESS FOR THE TREATMENT OF TEXTILE FIBRE MATERIALS

Christian Guth, Basel, and Jörg Binz, Reinach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 58,047, Jul. 16, 1979, abandoned. This application Nov. 14, 1980, Ser. No. 206,799

Claims priority, application Switzerland, Jul. 27, 1978, 8084/78

Int. Cl.[3] D06M *13/30;* D06P *1/62;* B01J *13/00*

U.S. Cl. 8—477 17 Claims

1. A foamed, aqueous composition which has a degree of foaming of 1:6 to 1:20, a foam half-life of more than 60 minutes and which contains at least

(a) a first surface-active agent as a major constituent, having an HLB-value of 0.1 to 10.0, and being a fatty alcohol of 12 to 24 carbon atoms or an ethylene-oxide adduct of said fatty alcohol containing 1 to 4 oxyethylene groups,

(b) a second surface-active agent as a minor constituent, having an HLB-value of more than 8.5 and at least 3.0 units higher than that of component (a), and being an alkali metal or ammonium salt of a fatty acid having 10 to 24 carbon atoms, of an alkylphenyl- or alkylnaphthalenesulfonic acid having 4 to 18 carbon atoms in the alkyl radical, of an alkylsulfonic acid having 10 to 24 carbon atoms in the alkyl radical, of a sulfuric acid alkyl ester having 10 to 24 carbon atoms, or of a sulfuric acid ester of an alkanol/ethylene oxide or alkylphenol/ethylene oxide adduct having in each case 4 to 12 carbon atoms in the alkyl radical and a degree of ethoxylation of 1 to 10, or a reaction product of a fatty acid having 10 to 24 carbon atoms with an alkanolamine having 2 to 6 carbon atoms, and

(C) a dye, or a fluorescent brightener or a textile chemical, wherein the weight ratio of (a):(b) is 4:1 to 1000:1.

4,413,999

AMIDOXIME DERIVATIVES, PROCESSES FOR THE PREPARATION

Charles Linder, Rehovot, and Gershon Aviv, Tel Aviv, both of Israel, assignors to Research Products Rehovot Ltd., Rehovot, Israel

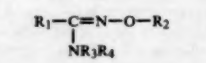
Filed Mar. 5, 1982, Ser. No. 355,260

Claims priority, application Israel, Mar. 17, 1981, 62389

Int. Cl.[3] C08F *8/30*

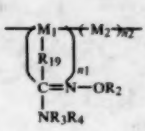
U.S. Cl. 8—540 52 Claims

1. Compounds of the formula I



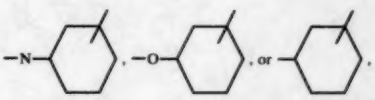
I

wherein R_1 is H, an alkyl group of 1 to 8 carbon atoms, phenyl, a heterocyclic ring structure of 5 to 8 atoms containing one or more nitrogen or oxygen atoms or combinations thereof or a bicyclic condensed ring system optionally containing at least one heterocyclic ring as defined, which groups are optionally substituted by one or more halogen, amine, alkylamine, dialkylamine, amidoxime substituted alkylamine, hydroxy, alkoxy, nitroxide, branched and straight chain alkyl, nitro, cyano, carboxamide, carbonyl, carboxyl, sulphonamide, sulphonimide, phosphonyl, sulphonyl, oxime, amidoxime optionally substituted with a mono or bicyclic heterocyclic radical containing at least two nitrogen atoms which radical itself it optionally substituted by halogen groups; a polymeric radical of the structure

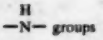


Ia

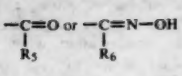
wherein R_{19} is attached to the carbon atom of formula 1 and is a valence bond, an alkyl group of 1 to 4 carbon atoms, a group of the formula —O—$(CH_2)_p$ or —NH—$(CH_2)_p$ where p is 1–6, or



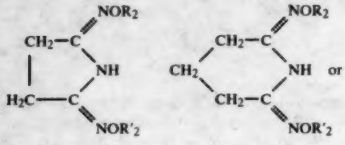
n_2 is 0 or a whole number defined by the polymers molecular weight and its relationship to n_1 defined by the ratio of n_2 to n_1, which may take values from 0 to 20, the n_1s and n_2s are randomly distributed or distributed in blocks in the polymer backbone and M_1 and M_2 are olefins, wherein M_2 may be the same or different monomers such that M_1 and M_2 form co-, ter-, tetra- or penta-polymers or M_1 and M_2 are cellulosic or polysaccharides or M_1 and M_2 are polysulfones, polyphenyleneoxides, polyamides, or epoxy polymers, respectively, wherein the polymer molecular weight may vary from 200–5,000,000 or to such a molecular weight, considered infinite, as may be defined by a crosslinked solid or gel; R_2 is a mono or bicyclic heterocyclic radical of cyclic carbonic acid imide derivatives containing at least two nitrogen atoms, and optionally substituted alone or in combination with radicals of halogens, —NH_2, mono and dialkyl amino of 1 to 6 carbons per alkyl chain, anilino, napthylamino, —OH, alkoxyl of 1 to 6 carbons, aryloxy; coloured and non-coloured tertiary amines, hydroxy, alkyl ammoniums of 1 to 6 carbons per alkyl chain, sulfonium, phosphonium and carboxylic, sulfonic and phosphonic acid derivatives of mono and dialkyl amino, anilino, naphthylamino, alkoxyl and aryloxy radicals; —SH, alkylthio of 1 to 6 carbon atoms, arylthio, hydrazine, —CN, phosphonic esters, —SO_2HN_2, arylsulfonamides, —SO_3H, phenyl,alkyl (1 to 6 carbons); synthetic or biological oligomers and polymers, which are substituted in R_2 through amino (alkyl or aryl) groups, hydroxyl (alkyl or aryl), sulfhydryl groups or heterocyclic

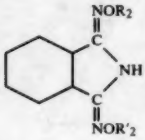


on the synthetic or biological oligomer or polymers, which R_2 groups themselves attached to an amidoxime on the same or different amidoxime polymers through R_{19}; amidoxime and diamidoxime groups which amidoxime groups themselves optionally are substituted by the hereinbefore defined substituents of R_1 and said diamidoxime groups are themselves optionally linked to a further R_2 group as hereinbefore defined forming an alternating polymeric structure of diamidoxime and R_2 groups; R_3 and R_4 independently H, or an alkyl of 1 to 4 carbon atoms or one, but not both, is



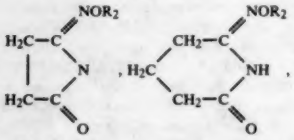
and the other, H, wherein R_5 or R_6 are alkyls of 2 to 5 carbon atoms optionally substituted by R_1, or a phenyl optionally substituted by R_1, or R_6 and R_1 together form structures of the formula

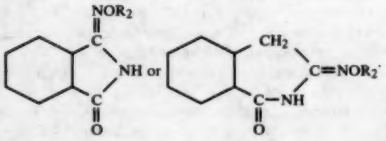




wherein R_2 is as defined and wherein R_2' is either R_2 or H, or wherein R_2 is H and R_4 is

and R_5 and R_1 together form structures of the formula:





wherein R_2 is as defined.

4,414,000

PROCESS FOR THE CONTINUOUS OR SEMICONTINUOUS DYEING OF VOLUMINOUS CELLULOSE FABRICS WITH AZO DEVELOPING DYESTUFFS USING ACRYLAMIDE POLYMERS

Hans-Ulrich von der Eltz, Frankfurt am Main; Peter Heinisch, Kelkheim, and Hans J. Ballmann, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst AG, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 288,015, Jul. 29, 1981. This application Jun. 16, 1982, Ser. No. 388,932

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1980, 3028845

Int. Cl.³ D06P *1/12, 3/68*

U.S. Cl. 8—555 **8 Claims**

1. In a process for the even dyeing of a voluminous woven fabric consisting of or containing preponderantly cellulose fibers, with at least one water-insoluble azo dyestuff produced on the fiber according to a continuous or semicontinuous method, in which the impregnation is performed by pre-padding the fabric web with a coupling component under alkaline conditions, and subsequently the development of the dyestuff is effected, wet-in-wet, by slop-padding the textile goods with a diazo component in the presence of an acid and/or an acid-forming substance, the improvement which compises incorporating into the acidic developing liquor containing the diazo component capable of being coupled combination of a polymeric component selected from the group consisting of homopolymers and copolymers of acrylic acid amide and mixtures of the foregoing, said polymeric component being incorporated in an amount of from 30 to 60 g/l in the form of a 2 to 8% (by weight) aqueous formulation, and of from 2 to 20 g/l of an anionic or nonionic wetting agent.

4,414,001

METHOD FOR THERMALLY DECOMPOSING AND GASIFYING COMBUSTIBLE MATERIAL IN A SINGLE FLUIDIZED REACTOR

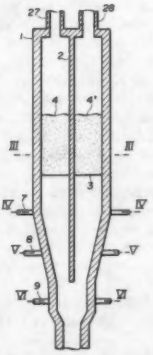
Daizo Kunii, No. 25-16, Nakamachi 1, Meguro-ku, Tokyo, Japan

Division of Ser. No. 109,294, Jan. 3, 1980, Pat. No. 4,337,066. This application Jan. 21, 1982, Ser. No. 341,492

Claims priority, application Japan, Jul. 11, 1979, 54-87584

Int. Cl.³ C10J *3/54*

U.S. Cl. 48—197 R **7 Claims**



1. A method for thermally decomposing and gasifying either liquid or solid combustible raw material in a single reactor in the form of cylindrical tower filled with solid powdered working medium in active fluidization, said reactor being provided with two vertical partitions, a first partition is extended downwards from the upper portion of the reactor so that the upper portion of the reactor tower is divided into two space sections, while the second partition is vertically extended at the lower and middle portions of the reactor substantially at a right angle to said first partition, said second partition extending lower than said first partition and into the lower portion of the reactor at a location above the bottom so that the reactor is divided into four space sections at the middle portion of the reactor, and at the lower portion of the reactor, the reactor is divided into two sections, wherein thermal decomposing and gasifying are performed by way of supplying the combustible raw material into a downwardly travelling working medium and at the same time supplying steam thereinto for generating and maintaining the active fluidization of the working medium in a thermal decomposition and gasification section, while burning and heating are performed by way of supplying air or a mixture gas of oxygen and steam into the upwardly travelling working medium accompanied by carbon or carbonaceous material produced during the preceding thermal decomposing and

gasifying process to burn said carbon or carbonaceous material in a combustion and heating section, said circulating working medium being adapted to displace upwards via the lower end of the first partition, wherein said method comprises the following steps of:

supplying combustible material into the middle or upper portion of the thermal decomposition and gasification section of the fluidized bed to disperse and mix the combustible material with the working medium so that the combustible material is thermally decomposed and gasified at a predetermined range of temperature so as to produce combustible gas,

displacing downwards the mixture of the working medium and the residual material of carbon or carbonaceous material produced during said thermal decomposition and gasification through one of two space sections of the fluidized thermal decomposition and gasification section divided by means of the second partition, said downwards displacing being effected substantially by the gravity force of said mixture,

transferring the mixture into the lower part of the fluidized combustion and heating section from the lower part of the thermal decomposition and gasification section via the lower end of the first partition,

further displacing upwards the mixture through one of two space sections of the fluidized combustion and heating section in a active fluidization state by way of supplying steam therein at the lower portion of said space section,

supplying air or mixture gas of oxygen and steam in both space sections at the middle portion of the combustion and heating section so that the carbon or carbonaceous material is burnt or partially oxidized therein in active fluidization so as to heat the working medium at the predetermined range of temperature,

removing the so produced combustion gas or combustible gas out of the reactor,

displacing downwards the working medium through the other of the two space sections of the fluidized combustion and heating section divided by means of the second partition, said downward displacing being effected substantially by the gravity of the working medium,

transferring the working medium into the lower part of the fluidized thermal decomposition and gasification section from the lower part of the combustion and heating section via the lower end of the first partition,

further displacing upwards the working medium through the other of the two space segments of the fluidized thermal decomposition and gasification section in a active fluidization state divided by means of the second partition by way of supplying steam therein at the lower portion of said space section, and

fluidizing the working medium by way of supplying steam at the middle portion in both space sections of the thermal decomposition and gasification section of the fluidized bed.

4,414,002

METHOD FOR GASIFICATION OF LARGE-SIZED VEGETABLE MATERIALS USING A FIXED BED GASOGENE

Jean Lucas, Paris; Jean-Francois Molle, Chcisy le Roy; Etienne Gille, Longjumeau, and Patrick Creze, Bois Guillaume, all of France, assignors to Centre National d'Etudes et d'Experimentation de Machinisme Agricole, Antony, France

Division of Ser. No. 90,911, Nov. 5, 1979, abandoned. This application Jun. 10, 1981, Ser. No. 272,369

Claims priority, application France, Nov. 6, 1978, 78 31356

Int. Cl.³ C10J *3/14*

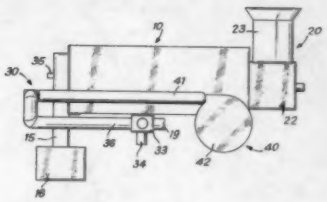
U.S. Cl. 48—209 **3 Claims**

1. A method for the gasification of relatively large-sized vegetable materials, said method comprising the steps of:

moving said materials in a fixed treatment chamber extending substantially horizontally and having opposite rear and forward ends, said materials being moved from said rear end towards said forward end through substantially the whole transverse section of said chamber and being subjected successively to drying, pyrolysis and gasification in successive areas of said chamber;

generating hot gases in a zone free of materials to be treated and located in said chamber in front of the natural talus created by the front of the whole bulk of materials which occupy substantially the whole transverse section of said chamber;

extracting gases from said chamber by aspiration at a location adjacent to the rear end thereof whereby a forced stream of hot gases is produced rearwardly through the whole bulk of materials contained in said chamber and over the whole transverse section thereof;



recycling said extracted gases into said zone in front of said natural talus and adding a comburent gas to said recycled gas whereby heat for generating said hot gases is produced by combustion, said hot gases being diluted in said zone before entering said natural talus, and said tars produced from the pyrolysis and carried away by said extracted gases being eliminated by said combustion in said zone;

adjusting said aspiration so that the temperature of said extracted gases is at least 500° C. after having passed through the materials contained in said chamber; and

taking out from said chamber and at a location in front of said pyrolysis area product, gas having passed through said material in said gasification area, whereby said product gas is free from tars.

4,414,003

PROCESS AND APPARATUS FOR THE RECOVERY OF SOLVENTS

Bernd Blaudszun, Steinkirchen, Fed. Rep. of Germany, assignor to Lohmann GmbH & Co., KG, Fed. Rep. of Germany

Filed Nov. 9, 1981, Ser. No. 319,236

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1980, 3042081; Nov. 7, 1980, 3042082

Int. Cl.³ B01D *53/04*

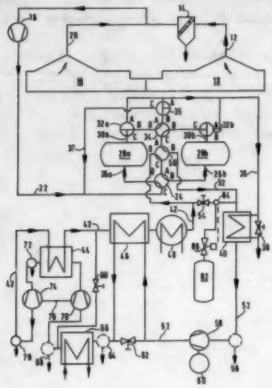
U.S. Cl. 55—18 **27 Claims**

1. A process for recovering solvents which are adsorbed by an adsorbent from exhaust air containing solvent vapors, said process including the steps of passing a hot stream of inert gas as the desorption medium from an inert gas circuit through the adsorbent, cooling the stream of inert gas to condense the solvent vapors picked up by the stream of inert gas, separating the solvent condensate, and re-using the reheated stream of inert gas, low in solvent vapors, as the desorption medium, the improvement comprising:

the steps of compressing the inert gas stream laden with the solvent vapors and cooling the inert gas stream laden with solvent vapors in an expansion turbine while delivering work from the expansion chamber, wherein both steps condense the solvent vapors.

17. Apparatus for the recovery of solvents containing at least one adsorbent vessel with inlet and outlet ducts for alternatingly transmitting a cold stream of exhaust air laden with solvent vapors and a stream of inert gas lean in solvent vapors,

at least one cooling means connected to the outlet duct of the inert gas stream which was laden in the adsorbent vessel with solvent vapors, at least one solvent separator following the cooling means, and at least one heating means following the last solvent separator and connected to the inlet duct to the



adsorbent vessel for heating the cooled stream of inert gas lean in solvent vapors, the improvement comprising:

an expansion turbine in the outlet duct of the inert gas stream laden with solvent vapors, said expansion turbine preceded by at least one compressor.

4,414,004

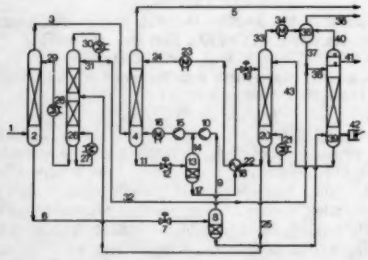
REMOVAL OF CONDENSABLE ALIPHATIC HYDROCARBONS AND ACIDIC GASES FROM NATURAL GAS

Eckhart Wagner, Ludwigshafen; Ulrich Wagner, Limburgerhof; Klaus Volkamer, Frankenthal, and Wolfgang Vodrazka, Freinsheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 10, 1982, Ser. No. 356,721

Int. Cl.³ B01D *53/14*

U.S. Cl. 55—48 **9 Claims**



1. A process for removing condensable aliphatic hydrocarbons and acidic gases such as H_2S, CO_2 and COS from natural gas containing these, which comprises:

(a) initially treating the natural gas with polyethylene glycol dialkyl ethers, as the solvent, in a first absorption stage to effect absorption of the condensable aliphatic hydrocarbons,

(b) then treating the natural gas drawn off from the first absorption stage with polyethylene glycol dialkyl ethers, as the solvent, under superatmospheric pressure in a second absorption stage, the acidic gases completely or partly being absorbed,

(c) treating the solvent charged with condensable aliphatic hydrocarbons which is obtained from the first stage with water in an extraction stage to form a hydrocarbon phase containing the condensable aliphatic hydrocarbons and an aqueous dialkyl ether phase, and separating the hydrocarbon phase from the aqueous dialkyl ether phase,

(d) regenerating the solvent charged with acidic gases which is obtained from the second absorption stage by expansion and/or stripping in a regeneration stage and

(e) recycling the regenerated solvent to the absorption.

4,414,005

METHOD OF ENCAPSULATING MATERIALS IN A ZEOLITE IN A STABLE MANNER

Paul J. De Bievre, Kasterlee; Etienne F. Vansant, Zoersel, and Guido J. Peeters, Berchem, all of Belgium, assignors to European Atomic Energy Community (Euratom), Luxembourg, Luxembourg

Filed Oct. 6, 1981, Ser. No. 309,222

Claims priority, application Netherlands, Oct. 13, 1980, 8005645

Int. Cl.³ B01D *53/04*

U.S. Cl. 55—75 **4 Claims**

3. A method of separating mixtures, which comprises contacting pore-containing zeolites with a mixture of components. selectively adsorbing at least one component of the mixture in the pores of the zeolite, separating the zeolite from the non-adsorbed component and desorbing the absorbed substances, said zeolite having been treated with a modifying agent selected from the group consisting of silanes, halosilanes, alkylsilanes, boranes, haloboranes and alkylboranes, germanes, halogermanes and alkylgermanes to reduce the pore size to a desired dimension.

4,414,006

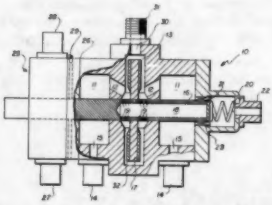
AIR SEPARATION FOR AN OIL PUMP

Gary D. Armstrong, 2552 Albatross Way, Sacramento, Calif. 95815

Filed Feb. 10, 1982, Ser. No. 347,628

Int. Cl.³ B01D *19/00*

U.S. Cl. 55—190 **3 Claims**



1. A device for separating air from oil or the like comprising in combination:

an oil/air inlet means,

means for directing the oil/air to said device,

separating means for moving the oil substantially radially outwardly while directing the air substantially radially inwardly,

an oil outlet for emitting the oil,

and venting means for emitting the air,

wherein said separating means includes an impeller disc mounting on a driven shaft,

wherein said driven shaft is provided with plural apertures for air migration, said shaft including a hollow core,

wherein said core communicates with said venting means for

air discharge, said venting means including an air pressure sensitive diaphragm proximate to a shaft end,

wherein said diaphragm is responsive to biasing means for back pressure,

wherein said directing means include oil/air intake chamber which store a quantum of the air/oil received from said air/oil inlet means,

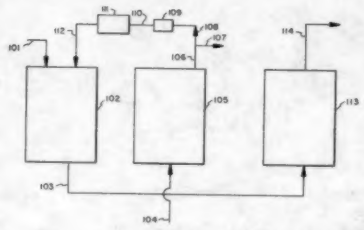
wherein said air/oil intake chamber communicates with said impeller via a radially inwardly sloped intake port including a pair of said intake chambers, ports, and inlet means on opposed face of said impeller which is housed in an associated impeller chamber.

4,414,007

PROCESS FOR SEPARATION OF GAS MIXTURE

Bernard A. Bucchianeri, Monongahela, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Aug. 31, 1981, Ser. No. 298,052
Int. Cl.³ F25J *3/02*
U.S. Cl. 62—12 **26 Claims**



1. In a process for the purification of the low boiling constituents of a compressed gas mixture comprising gases from a coal conversion process by cooling to low temperatures in cyclical alternated regenerators to condense high-boiling constituents of said gas mixture comprising (1) passing said gas mixture through a first regenerator from the warm end to the cold end of the same to cool said gas mixture and to condense said high-boiling constituents of said gas mixture thereby producing a purified gas stream; (2) passing large quantities of a scavenging gas which is at a lower pressure than said gas mixture in said first regenerator through a second regenerator from the cold end to the warm end of the same to clean said second regenerator and to re-evaporate said high boiling constituents, and (3) passing at least part of said purified gas stream through a third regenerator from the cold end to the warm end of same to re-cool said third regenerator, the improvement comprising compressing and recycling at least part of said scavenging gas which has passed through said second regenerator through said first regenerator from the warm end to the cold end and repeating the process as defined above and wherein said scavenging gas which has passed through said second regenerator is very dilute in said high-boiling constituents.

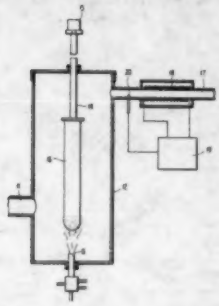
4,414,008

PROCESS FOR PRODUCING OPTICAL FIBER PREFORM

Takao Edahiro, Ibaraki; Tetsuo Miyajiri, Kanagawa; Hiroshi Yokota, Kanagawa, and Toru Kuwahara, Kanagawa, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo and Sumitono Electric Inds., Ltd., Osaka, both of, Japan

Filed Dec. 11, 1981, Ser. No. 329,919
Claims priority, application Japan, Dec. 12, 1980, 55-174729
Int. Cl.³ C03B *19/00, 37/07*
U.S. Cl. 65—3.12 **2 Claims**

1. A process for producing a porous optical fiber preform by hydrolyzing a gaseous glass forming material with a flame from an oxyhydrogen burner and depositing the resulting soot in a rod form in a muffle furnace, wherein the muffle furnace is supplied with a preheated gas other than that from the oxyhydrogen burner, said preheated gas being air supplied at a



constant temperature at a level slightly lower than the temperature of the gas within the muffle furnace.

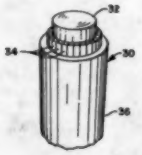
2. A processing according to claim 1, wherein said preheated air has a temperature less than 50° C. lower than the average temperature of the gas within the muffle furnace.

4,414,009

METHOD OF MAKING AN IMAGE INTENSIFIER FACEPLATE

Walter P. Siegmund, Woodstock, Conn., assignor to Warner Lambert Technologies, Inc., Southbridge, Mass.

Division of Ser. No. 178,317, Aug. 15, 1980, Pat. No. 4,393,322.
This application Jun. 11, 1982, Ser. No. 387,340
Int. Cl.³ C03B *23/207*
U.S. Cl. 65—4.3 **4 Claims**



1. The method of making faceplates for image intensifiers comprising the steps of:

grinding and polishing the side of a glass rod;

assembling against said rod a closely related succession of relatively thin pieces of light-absorbing glass;

fitting a tube of supporting glass over said assembly of pieces and rod;

heating and stretching the resulting faceplate preform into a boule;

annealing and transaxially slicing flat plates from said boule; and

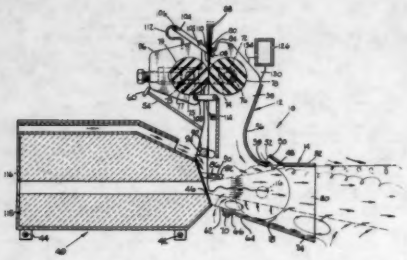
machining said flat plates to configurations desired of said faceplates.

4,414,010

APPARATUS FOR ATTENUATING MINERAL FIBERS

John F. Chin, Toledo; Joseph A. Rhodes, Sylvania, both of Ohio, and James E. Kusterer, Sedalia, Colo., assignors to Manville Service Corporation, Denver, Colo.

Filed Jun. 21, 1982, Ser. No. 390,567
Int. Cl.³ C03B 37/065
U.S. Cl. 65—16 10 Claims



1. An attenuation shroud in combination with a fiber attenuating burner, said burner having a degree of play in its mounting to accommodate positioning with respect to upstream elements, said play varying the alignment of said burner's outlet orifice, said attenuation shroud being characterized by a first upstream portion stationarily mounted adjacent said attenuating burner for receiving and directing a flow of hot gases from said outlet orifice, a second downstream portion hingedly mounted to said first portion for pivotal movement about a generally horizontal axis, control means to enable said second portion to be pivotally adjusted relative to said first portion to accommodate alignment variations of the attenuating burner's outlet orifice.

4,414,011

METHOD OF SECURING FIBER REINFORCED GLASS MATRIX COMPOSITE MATERIAL TO STRUCTURAL MEMBERS

George K. Layden, Wethersfield, and Karl M. Prewo, Vernon, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 25, 1982, Ser. No. 381,802
Int. Cl.³ C03C 25/00
U.S. Cl. 65—18.1 10 Claims

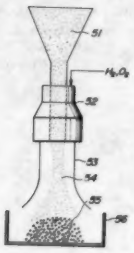
1. A method of securing fiber reinforced glass matrix composite material to a structural member comprising molding and machining a high temperature stable fiber reinforced glass matrix composite material into rivet or bolt form, forming substantially concentric holes in the composite material and structural member at the point of attachment, securing the composite material to the structural member by inserting the rivet or bolt through such holes and closing the open end of the rivet or bolt by heat deforming or nut means respectively, so as to produce a composite material-structural member which remains secure under extreme temperature fluctuations.

4,414,012

FABRICATION METHODS OF DOPED SILICA GLASS AND OPTICAL FIBER PREFORM BY USING THE DOPED SILICA GLASS

Shoichi Suto; Hiroyuki Suda; Fumiaki Hanawa; Motohiro Nakahara, all of Mito, and Nobuo Inagaki, Katsuta, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Sep. 8, 1981, Ser. No. 300,296
Claims priority, application Japan, Sep. 11, 1980, 55/126556; Sep. 16, 1980, 55/127102; Nov. 4, 1980, 55/154960; Nov. 4, 1980, 55/154961; Nov. 26, 1980, 55/166262; Apr. 13, 1981, 56/54332; Apr. 13, 1981, 56/54334
Int. Cl.³ C03B 19/06, 20/00
U.S. Cl. 65—18.2 17 Claims



1. A method of manufacturing doped silica glass, comprising the steps of:

providing either silica glass fine particles or quartz powder produced by subjecting an easily oxidizable silicon compound to thermal oxidation or flame hydrolysis;

dissolving a dopant oxide into said silica glass fine particles or said quartz powder by means of oxidation of a gas for forming doped silica glass on the surfaces of said silica glass fine particles or said quartz powder to form doped silica glass fine particles or doped quartz powder; and

sintering to vitrify said doped silica glass fine particles or said doped quartz powder to form doped silica glass.

17. A method of manufacturing doped silica glass, comprising the steps of:

exposing quartz powder to a gas for forming doped silica glass containing $SiCl_4$, a gaseous additive for producing a dopant which is capable of forming a solid solution with SiO_2 by reacting with H_2O, and water vapor to form a SiO_2-dopant solid solution, and

vitrifying the resulting SiO_2-dopant solid solution.

4,414,013

METHOD OF MAKING BLACK GLASS BY UTILIZING INCINERATED WASTE GLASS

David A. Connell, 747 Dividing Rd., Severna Park, Md. 21146

Filed Apr. 26, 1982, Ser. No. 372,025
Int. Cl.³ C03B 5/08
U.S. Cl. 65—28 18 Claims

1. A process for producing black glass comprising:

(a) reclaiming glass material including ferrous oxide and ferric oxide from incinerated municipal waste,

(b) melting said glass material in the range from about 1300° C. to about 1500° C. to convert at least a portion of the iron oxides therein to Fe_3O_4, thereby causing black coloration of the glass material and stratifying the mixture wherein one of the layers comprises a substantially homogeneous black glass,

(c) cooling the molten glass to obtain a middle layer of substantially homogeneous black glass and a top and bottom layer of non-homogenerous material, the top layer being of extraneous and undisolved matter and the bottom layer being of concentrated metals,

(d) removing the non-homogeneous material from the substantially homogeneous black glass layer.

4,414,014

METHOD OF PRODUCING A BUBBLE-FREE VITREOUS MATERIAL

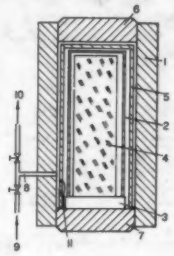
Rolf Bruning; Poul-Erik Breidenbach, both of Bruchköbel; Norbert Cibis, Frankfurt am Main; Fritz Aldinger, Rodenbach, and Waltraud Werdecker, Hanau, all of Fed. Rep. of Germany, assignors to Heraeus Quarzschmelze GmbH, Hanau am Main, Fed. Rep. of Germany

Filed Oct. 19, 1981, Ser. No. 312,469

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1980, 3039749

Int. Cl.³ C03B *20/00, 32/00;* **C03C** *15/02*

U.S. Cl. 65—31 **12 Claims**



1. A method for the production of a shaped article of a bubble free vitreous material, and in particular bubble free vitreous silica, formed a shaped article of bubbles-containing vitreous material, and in particular vitreous silica, which comprises heating said material in the form of a shaped article while said shaped article is disposed on a support in a furnace and while heating said shaped article applying an omnidirectional gas pressure thereagainst which pressure is applied by a gas which is insoluble in said material, said gas being at an omnidirectional pressure of 100 to 3,000 bars, said material being heated to a temperature which reduces the viscosity of said material to a value between $10^{13.5}$ and 10^{8} Pa.sec, said material in the form of a shaped article being heated at said temperature and pressure for a period of not less than 10 minutes and thereafter cooling said material to room temperature over a period of less than 10 hours.

4,414,015

PROCESS AND APPARATUS FOR FORMING A METAL OR METAL COMPOUND COATING

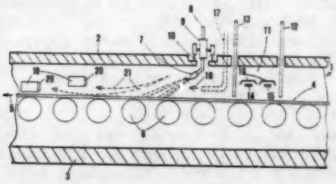
Robert Van Laethem, Loverval, and Robert Terneu, Charleroi, both of Belgium, assignors to BFG Glassgroup, Paris, France

Filed Jun. 18, 1981, Ser. No. 275,048

Claims priority, application United Kingdom, Jun. 20, 1980, 8020166

Int. Cl.³ C03B *29/04*

U.S. Cl. 65—60.3 **24 Claims**



1. A process for forming a metal or metal compound coating on a face of a freshly formed ribbon of hot glass during its travel from a flat glass forming installation, by contacting such face at a coating station with a fluid medium or fluid media comprising a substance or substances from which said coating metal or metal compound is formed on said face, characterised in that preparatory to being coated, the glass (**4**, **23**) is thermally conditioned at a thermal conditioning station between the flat glass forming installation and the coating station, so as to eliminate or reduce temperature gradients across the ribbon width to be coated.

14. Apparatus suitable for use in coating a freshly formed ribbon of hot glass during its travel from a flat glass forming installation, said apparatus comprising means (**7–10**, **29**, **30**) for delivering (a) fluid coating medium or media into contact with the glass (**4**, **23**) at a coating station, characterised in that there is means (**14–16**, **36**) whereby the temperature of one or more portions of the ribbon width can be conditioned selectively or differentially at a thermal conditioning station constituted as a heating station incorporating heating means and located between the flat glass forming installation and said coating station, so as to eliminate or reduce temperature gradients across the ribbon width to be coated, and regulating means for varying the selective or differential heat supply distribution at said heating station.

4,414,016

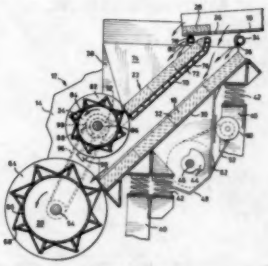
APPARATUS FOR THE PELLETIZATION OF HEAT-LIQUIFIABLE SOLID MATERIALS

Michael Orlander, Dundas; Robert P. Cotsworth, and Peter A. MacKenzie, both of Hamilton, all of Canada, assignors to National Slag Limited, Hamilton, Canada

Filed May 13, 1982, Ser. No. 377,871

Int. Cl.³ C03B *19/04*

U.S. Cl. 65—141 **8 Claims**



1. Apparatus for the pelletization of molten heat-liquifiable solid material comprising:

an apparatus frame,

feed means providing a primary discharge means for molten material fed thereto up to a predetermined flow rate, and a secondary discharge means for excess molten material when the flow rate of the material fed thereto is greater than said predetermined flow rate,

first and second feed plates mounted by the frame one above the other to receive respectively material from the primary and secondary discharge means and providing respective first and second feed surfaces over which the received molten material flows under gravity.

first and second radially-vaned projecting rotors mounted by the frame for rotation about respective horizontal axes and on to the respective peripheries of which the molten material is fed respectively from the first and second feed surfaces for projection into the air for cooling and pellitization thereof, and

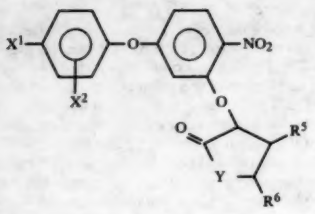
motor means for rotating the two rotors about their respective axes in the respective required directions.

4,414,017
HERBICIDAL 3-BUTYROLACTONES

David C. K. Chan, Petaluma, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 27, 1980, Ser. No. 153,476
Int. Cl.³ A01N *43/08, 43/10;* C07D *333/32, 307/32*
U.S. Cl. 71—88 13 Claims

1. A compound having the formula:



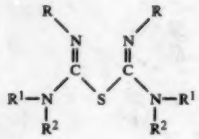
wherein
X^1 is halo or trihalomethyl;
X^2 is hydrogen or halo; Y is oxygen or sulfur and
R^5 and R^6 are independently hydrogen, alkyl of 1 to 6 carbon atoms, alkenyl of 2 to 6 carbon atoms, alkynyl of 2 to 6 carbon atoms or phenyl.

4,414,018
HERBICIDES

Roberto Colle; Franco Gozzo, and Ciro Preziuso, all of Milan, Italy, assignors to Montedison S.p.A., Milan, Italy

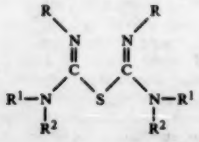
Continuation of Ser. No. 159,957, Jun. 16, 1980, abandoned. This application Mar. 9, 1982, Ser. No. 356,422
Claims priority, application Italy, Jun. 15, 1979, 23621 A/79
Int. Cl.³ A01N *33/02;* C07C *119/00*
U.S. Cl. 71—88 5 Claims

1. Compounds of the formula:



wherein
R is phenyl substituted by one or more halogen atoms, one or more alkyl or haloalkyl groups with from 1 to 3 carbon atoms;
R^1 and R_2 are the same or different and each represents an alkyl C_1–C_3, an alkoxyl C_1–C_3, or R^1 or R^2 together with the nitrogen atom to which they are bonded form a piperidino or morpholino radical.

5. A method of fighting infestations of monocotyledons and dicotyledons, characterized in that one or more compounds, either as such or in the form of suitable compositions, are spread on the soil prior to or after the emergence of the plants from the soil, said compounds having the formula:



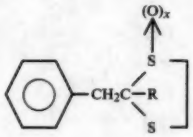
wherein
R is phenyl optionally substituted by one or more halogen atoms, one or more alkyl or haloalkyl groups with from 1 to 3 carbon atoms;
R^1 and R_2 are the same or different and each represents an alkyl C_1–C_3, an alkoxyl C_1–C_3, or R^1 or R^2 together with the nitrogen atom to which they are bonded form a piperidino or morpholino radical.

4,414,019
2-BENZYL 1,3-DITHIOLANES AS HERBICIDAL ANTIDOTES

Arnold D. Gutman, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Feb. 22, 1982, Ser. No. 351,047
Int. Cl.³ E05B *65/00*
U.S. Cl. 71—91 20 Claims

1. The method of protecting a crop from injury due to at least one thiolcarbamate herbicide, comprising preplant incorporation in the soil in which said crop is to be planted, a nonphytotoxic antidotally effective amount of a compound corresponding to the formula



wherein R is hydrogen or lower alkyl having 1–3 carbon atoms, and x is 0 or 1.

4,414,020
COMPOSITION AND PROCESS FOR PROMOTING THE GROWTH OF CROP PLANTS

Karl H. Heier, Frankfurt am Main; Hans J. Nestler, Königstein; Hermann Bieringer, Eppstein, and Klaus Bauer, Rodgau, all of Fed. Rep. of Germany, assignors to Hoechst AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 2, 1981, Ser. No. 222,077
Claims priority, application Fed. Rep. of Germany, Jan. 3, 1980, 3000076
Int. Cl.³ A01N *37/36, 33/02*
U.S. Cl. 71—108 8 Claims

1. A herbicidal composition for promoting the safening of cereal crop plants comprising an effective amount of phenoxy alkanoic acid herbicide and an antidotally effective amount of an antidote of the formula

$$Ar—O—C_nH_{2n}—R$$

or a metal salt or acid addition product thereof, in which Ar is phenyl mono-, di- or trisubstituted with chlorine or bromine; n is 1, 2 or 3 and R is $C(NH_2)NOH$ and wherein said herbidical composition comprises from about 2 to about 80 percent by weight of antidote and herbicide, the ratio of antidote to herbicide being in the range of 0.125 to 7 parts antidote per part herbicide.

4,414,021
PROCESS FOR THE SYNTHESIS OF IRON POWDER

William W. Welbon, Belleair, Fla., assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed May 6, 1982, Ser. No. 375,519
Int. Cl.³ C21B *15/00*
U.S. Cl. 75—0.5 AA 7 Claims

1. A process for preparing metallic iron powder having a spongelike structure, a total iron content of 97% minimum, a metallic iron (Fe°) content of 89% minimum, an oxygen content of 2.3% maximum, a Green strength of 4000–6000 psi, and a Fischer subsive size of 1.5–3.5, with a minimum of 70% of a

size of −325 mesh and a maximum of 1.0% of a size of +100 mesh.

comprising,

heating to boiling for 1–3 hours, an aqueous solution comprising 0.4–2 M of a solubilized ferric salt, 10–40 g/l of formic acid or sulfuric acid and 60–120 g/l of urea, thereby obtaining a precipitate,

separating the precipitate,

drying it, and

reducing the dried precipitate by treating it with hydrogen gas at 650°–900° C. for ½–2 hours,

thereby producing iron (Fe°) powder having a total iron content of 97% minimum, a metallic iron (Fe°) content of 89% minimum, an oxygen content of 2.3% maximum, a Green strength of 4000–6000 psi, and a Fisher subsive size of 1.5–3.5, with a minimum of 70% of a size of −325 mesh and a maximum of 1.0% of a size of +100 mesh.

4,414,022

METHOD AND APPARATUS FOR SMELTING SULFIDIC ORE CONCENTRATES

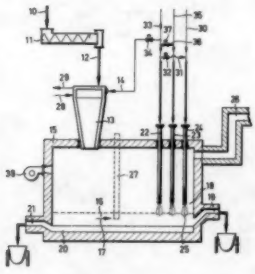
Gerhard Melcher, Cologne, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Jan. 18, 1982, Ser. No. 340,300

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1981, 3101369

Int. Cl.³ C22B *5/16*

U.S. Cl. 75—26 **7 Claims**



1. In a method of smelting a sulfidic ore concentrate or the like in which said concentrate is melted in an oxidizing atmosphere, the melt is after-treated with reducing gases from a plurality of lances which blow said reducing gases onto said melt in the form of concentrated streams of high kinetic energy, to produce a metal-rich phase and a slag phase, the improvement which comprises:

oxidizing said concentrate sufficiently to form an enriched metal matte containing more than 75% by weight metal at a rate of more than 500 metric tons/day, said oxidizing being carried out in a smelting cyclone having a melt outlet temperature of at least 1600° C., circulating feed water through said smelting cyclone to generate steam, and recovering the steam thus produced.

4,414,023

IRON-CHROMIUM-ALUMINUM ALLOY AND ARTICLE AND METHOD THEREFOR

George Aggen, and Paul R. Borneman, both of Sarver, Pa., assignors to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed Apr. 12, 1982, Ser. No. 367,710

Int. Cl.³ C22C *38/06*

U.S. Cl. 75—124 **23 Claims**

1. A hot workable ferritic stainless steel alloy resistant to thermal cyclic oxidation and scaling at elevated temperatures and suitable for forming thereon an adherent textured aluminum oxide surface, the alloy consisting essentially of, by weight, 8.0–25.0% chromium, 3.0–8.0% aluminum, and an addition of at least 0.002% and up to 0.05% from the group consisting of cerium and lanthanum, neodymium and praseodymium, a total of all rare earths up to 0.060%, up to 4.0% silicon, 0.06% to 1.0% manganese and normal steelmaking impurities of less than 0.050% carbon, less than 0.050% nitrogen, less than 0.020% oxygen, less than 0.040% phosphorus, less than 0.030% sulfur, less than 0.50% copper, less than 1.0% nickel, and the sum of calcium and magnesium less than 0.005%, the remainder being iron.

4,414,024

MARTENSITIC HEAT-RESISTANT STEEL

Masao Siga; Seishin Kirihara, both of Hitachi; Mitsuo Kuriyama, Tokai; Takatoshi Yosioka, Hitachi; Shintaro Takahashi, Hitachi, and Takehiko Yoshida, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 26, 1982, Ser. No. 411,802

Claims priority, application Japan, Aug. 26, 1981, 56-132798

Int. Cl.³ C22C *38/22*

U.S. Cl. 75—126 C **6 Claims**

1. A martensitic heat-resistant steel consisting essentially of 0.1 to 0.2 wt.% of carbon, up to 0.4 wt.% of silicon, up to 1 wt.% of manganese, 9 to 12 wt.% of chromium, 0.1 to 0.3 wt.% of vanadium, 0.02 to 0.25 wt.% of niobium, 0.03 to 0.1 wt.% of nitrogen, up to 1 wt.% of nickel, molybdenum and tungsten in amounts falling within the range encompassed by lines connecting a point A (0.7 wt.% of molybdenum and 1.1 wt.% of tungsten), a point B (1.2 wt.% of molybdenum and 1.1 wt.% of tungsten), a point C (1.6 wt.% of molybdenum and 0.33 wt.% of tungsten) and a point D (0.7 wt.% of molybdenum and 0.33 wt.% of tungsten), and the balance of iron; said steel having a fully tempered martensitic structure and a Cr equivalent of up to 10 and showing substantially no δ ferritic structure and when said steel is subjected to tempering after quenching, the creep rupture strength for 10^5 hours at 600° C. is 11 kg/mm^2 or more.

4,414,025

PROCESS FOR ADDITION OF SILICON TO IRON

Chi-Ming Yang, Kaohsiung, Taiwan, assignor to China Steel Corporation, Kaohsiung, Taiwan

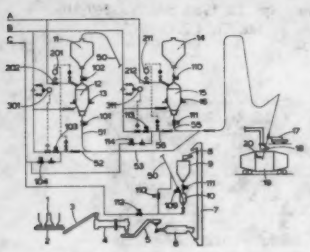
Filed Jul. 20, 1982, Ser. No. 400,183

Int. Cl.³ C22C *33/00*

U.S. Cl. 75—129 **10 Claims**

1. A process for the addition of ferro-silicon to molten iron

to increase the silicon content which comprises conveying pulverized ferro-silicon powder from a container which is at a preset pressure P_1 to a conveyor line in which line gas flow is controlled by at least two valves set to open at predetermined



gas pressures to establish gas pressure P_2 in said line and further conveying said ferro-silicon through an adjustable lance into the molten iron, the rate of injection of the ferro-silicon being controlled by the difference in pressures P_1 and P_2 by a differential pressure recording controller.

4,414,026

METHOD FOR THE PRODUCTION OF FERROCHROMIUM

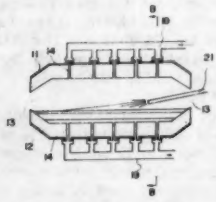
Tsutomu Fukushima; Kiyoshi Kawasaki, and Sadayuki Sasaki, all of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 29, 1982, Ser. No. 403,049

Claims priority, application Japan, Jul. 30, 1981, 56-118500; Jul. 31, 1981, 56-119291

Int. Cl.³ C22C *33/00*

U.S. Cl. 75—130.5 **7 Claims**



1. A method for producing ferrochromium comprising the steps of:

charging materials comprising chromium ores, fluxes and carbonaceous reducing agents into a rotary furnace or a shaft furnace;

preheating said materials under conditions selected from reducing and non-reducing conditions;

introducing said preheated materials into a rotary furnace being at an angle of from horizontal to tilted up to a maximum of 35° with respect to the axis of said rotary furnace; and

blowing a gas selected from air, oxygen and mixtures thereof into said rotary furnace through a plurality of small openings in the shell and refractory lining of the rotary furnace, thereby subjecting the material to a smelting reduction thereby producing a molten metal and slag, wherein during the smelting reduction process, a layer of carbonaceous agents at least 50 mm thick is maintained on said materials.

4,414,027

METHOD FOR OBTAINING IRON-BASED ALLOYS ALLOWING IN PARTICULAR THEIR MECHANICAL PROPERTIES TO BE IMPROVED BY THE USE OF LANTHANUM, AND IRON-BASED ALLOYS OBTAINED BY THE SAID METHOD

Mario Gorgerino, Meyzieu, and Daniel Videau, Le Touvet, both of France, assignors to Companie Universelle d'Acetylene et d'Electrometallurgie, France

Division of Ser. No. 26,778, Apr. 3, 1979, Pat. No. 4,290,805. This application Apr. 27, 1981, Ser. No. 257,859

Claims priority, application France, Apr. 6, 1978, 78 10254

Int. Cl.³ C22C *33/08*

U.S. Cl. 420—578 **2 Claims**

1. Alloy for the addition to iron-based alloys to provide such alloys which are substantially devoid of pinholes and cavities in spheroidal graphite cast-irons, and of carbides in flaky grey-iron and having improved castability, rollability, anisotropy and mechanical properties, said alloy having the following composition in percent by weight:

Si = 60–90
Ca = 0.01–4
Al = 0.1–4
La = 0.01–5
Fe = the balance.

4,414,028

METHOD OF AND APPARATUS FOR SINTERING A MASS OF PARTICLES WITH A POWDERY MOLD

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

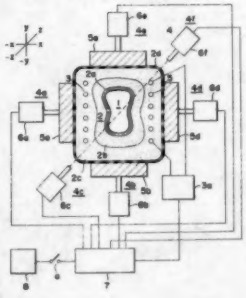
Filed Apr. 8, 1980, Ser. No. 138,448

Claims priority, application Japan, Apr. 11, 1979, 54-43851; Apr. 16, 1979, 54-47012; Apr. 19, 1979, 54-48824; Aug. 31, 1979, 54-111428

The portion of the term of this patent subsequent to Jun. 16, 1998, has been disclaimed.

Int. Cl.³ B22F *3/16, 3/14;* B30B *7/04*

U.S. Cl. 419—31 **13 Claims**



1. A method of sintering a sinterable mass of particles, comprising the steps of:

(a) imbedding the sinterable mass in a porous mass of particulate heat-resistant material, said porous mass constituting a force-transmitting medium for transferring pressures uniformly to said sinterable mass,

(b) disposing said porous mass in pressure-reception relationship in a multi-axial compression system capable of applying plural independent axial pressures externally to said porous mass along a plurality of axes intersecting generally at a point in said sinterable mass, each axis lying generally orthogonal to the adjacent axes,

(c) applying thermal energy sufficient for sintering said sinterable mass;

(d) in a first stage of sintering, applying said independent

pressures, set at a first magnitude, simultaneously along said axes to multi-directionally compress said sinterable mass through the medium of said porous mass,

(e) in a second stage of sintering, applying said independent pressures set at a second magnitude, which is greater than said first magnitude, successively and cyclically along said axes, and

(f) in a third and final stage of sintering, applying said independent pressures set at a third magnitude, which is greater than said second magnitude, simultaneously along said axes.

4,414,029

POWDER MIXTURES FOR WEAR RESISTANT FACINGS AND PRODUCTS PRODUCED THEREFROM

Harold C. Newman, Fallon, Nev., and William M. Stoll, Ligonier, Pa., assignors to Kennametal Inc., Latrobe, Pa.

Filed May 20, 1981, Ser. No. 265,534

Int. Cl.³ C22C *29/00*

U.S. Cl. 75—252 **6 Claims**

1. A mixture of hardfacing powders comprising: macrocrystalline WC particles; 0.05 to 0.5 weight percent niobium metal powder; and 0.05 to 1.0 weight percent molybdenum metal powders.

4,414,030

FIBER-REINFORCED CEMENT, AND PROCESS

Jose M. Restrepo, Calle 85 No. 14-70, Of. 301-, Bogota, Colombia

Filed Nov. 25, 1981, Ser. No. 325,035

Int. Cl.³ C04B *31/34*

U.S. Cl. 106—90 **12 Claims**

1. A cement mortar consisting essentially of:

water, particulate mortar components of cement and sand, and separate reinforcing filaments consisting essentially of filaments obtained from polyolefin film,

said separate microfibrillated filaments consisting in sections shredded from non-twisted fibrillated ribbons having a length of up to 50 mm long, with said fibrillated ribbons having been split apart from said polyolefin film and subjected to microfibrillation by stirring particulate mortar components and said reinforcing filaments to effect stretching the fibrillated film fibrils to breakage so generating smaller splinters which are the microfibrils,

wherein said separate reinforcing filaments have filamentary structure comprising hooked microfibrils laterally branching from points along the length of said separate filaments, and

wherein separate reinforcing plastic filaments are evenly distributed throughout the body of said cement mortar in a randomly oriented fashion along all of its spatial directions.

4,414,031

FIBER-CONTAINING PRODUCTS MADE WITH HYDRAULIC BINDER AGENTS

Josef Studinka, Zürich, and Peter E. Meier, Wädenswil, both of Switzerland, assignors to Ametex AG, Niederurnen, Switzerland

Filed Mar. 19, 1982, Ser. No. 359,943

Claims priority, application Switzerland, Mar. 20, 1981, 1919/81

Int. Cl.³ C04B *31/34*

U.S. Cl. 106—90 **21 Claims**

1. Solid, fiber-containing products manufactured with hydraulic binder agents, characterized in that they contain fibers of polymerized acrylic nitrile as reinforcement fibers having a molar concentration of acrylic nitrile units of from 98 to 100%, which maintain their strength characteristics during and after the setting process.

4,414,032

ANTI-FLOODING AGENT FOR PAINTS AND PLASTERS

Walter Schrattenholz, Mainz-Gonsenheim; Eckhard Hilgenfeldt, and Volker Knittel, both of Wiesbaden-Schierstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

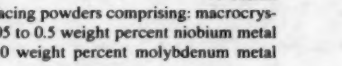
Continuation of Ser. No. 906,588, May 16, 1978, abandoned. This application Jul. 30, 1979, Ser. No. 62,080

Int. Cl.³ C08K *5/08, 5/17*; C08L *1/26*

U.S. Cl. 106—186 **4 Claims**

1. In a process for preventing the flooding of color pigments in aqueous plastic dispersion paints, plastic-based plasters, and distemper paints containing cellulose ethers, in which an agent is added to said paint or plaster, while it is still in the white state or after it has been colored by the addition of said colored pigments, said agent being based on a block polymer in which a di- or polyamine is present as the initial molecule on which alkylene oxide units are added,

the improvement comprising adding a block polymer obtained from one mole of a di- or polyamine of the general formula I



(I)

wherein

R is an alkylene group with 2 to 6 carbon atoms, and

x is a whole number from 1 to 4,

by reaction with about 5 to 50 moles of ethylene oxide, followed by reaction with about 5 to 100 moles of propylene oxide.

4,414,033

PROCESS FOR PREPARING FERRIFERROCYANIDE PIGMENTS

Arvind S. Patil, Wyoming; John H. Bantjes, and John T. Ouderkirk, both of Holland, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Nov. 6, 1981, Ser. No. 318,752

Int. Cl.³ C08K *3/00*; C09D *11/00*; C09C *1/26*

U.S. Cl. 423—367 **7 Claims**

1. A process for preparing a ferriferrocyanide pigment in the absence of ammonium sulfate comprising

(a) forming a reaction mixture containing a ferrous salt and an alkali metal ferrocyanide in an aqueous solution in a mole ratio of ferrous salt to alkali metal ferrocyanide of from 1:0.9 to 1:1.5;

(b) adding an alkaline compound to the solution in an amount sufficient to raise the pH to at least 9;

(c) oxidizing the basic solution by aeration;

(d) heating the solution to from 10° C. to 90° C.; and

(e) recovering the pigment.

4,414,034

NOVEL ADDITIVE BLENDS FOR CEMENTITIOUS MATERIALS

Stanley A. Lipowski, Livingston, N.J., assignor to Diamond Shamrock Corporation, Dallas, Tex.

Filed Jul. 19, 1982, Ser. No. 399,758

Int. Cl.³ C04B *7/35*

U.S. Cl. 106—90 **12 Claims**

1. An additive for cementitious materials comprising:

(a) at least one salt of naphthalene or lower alkyl substituted naphthalene sulfonic acid formaldehyde condensate and

(b) at least one water-soluble resin selected from the group consisting of resorcinol-formaldehyde and catechol-formaldehyde resins.

4,414,035
METHOD FOR THE REMOVAL OF ASPHALTENIC DEPOSITS

Michael E. Newberry, Chesterfield, and Kenneth M. Barker, Crestwood, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

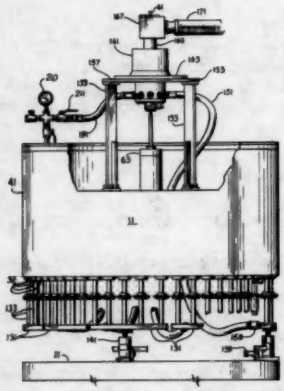
Filed May 21, 1979, Ser. No. 40,628
Int. Cl.³ B08B 3/08
U.S. Cl. 134—3 14 Claims

1. A process for removing organic deposits containing asphaltenic constituents from surfaces which comprises contacting said organic deposits with a solvent mixture containing
(1) an aromatic solvent, and
(2) a hydrocarbon-substituted-alkarylsulfonic acid.

4,414,036
SANITIZER SYSTEM AND SANITIZING METHOD FOR CARBONATED BEVERAGE CONTAINER FILLER MACHINE

Frank E. Anderson, 1717 Queensbury Way, and Robert A. Martin, Rte. #5, Box 406, both of Fort Smith, Ark. 72901

Filed Sep. 18, 1981, Ser. No. 303,354
Int. Cl.³ B08B 9/00
U.S. Cl. 134—23 13 Claims



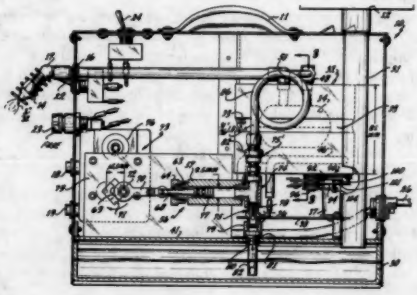
1. A sanitizer system for a beverage container filler machine having a rotating bowl and associated circular array of filler valves, a reservoir and a rotating conveyor comprising
a plurality of collector manifolds, each having an outlet opening and at least three upwardly extending tubes with lips at the top thereof adapted to seal against seals of filler machine valves, said tubes being in an arcuate arrangement with a radius corresponding to that of a filler machine valve array,
means for holding each said manifold in a raised position on said rotating conveyor to cause all of its tubes to seat and seal against corresponding valves of said bottle filling machine and to receive liquid flow from said valves when open,
a plurality of flexible hoses, each connectable at one end to one of the outlet openings of said manifolds,
a stationary return pipe connected to said reservoir,
a rotating collector located above said bowl and having a plurality of inlets with said hoses connected thereto and a rotatable, liquid-tight connection with said return pipe,
whereby a liquid return path is provided from said manifolds through said rotatable liquid-tight connection to said stationary return pipe and to a reservoir.

6. A method of sanitizing a bottle filler machine having a reservoir, a rotating conveyor and a rotating bowl with a circular array of filler valves comprising the steps of
placing a plurality of collector manifolds on said conveyor, each manifold having upwardly extending tubes with lips at the top thereof vertically aligned with seals of filler machine valves,
supporting said manifolds in a raised position on said conveyor in a position to receive liquid flow from all said valves when open,
connecting a plurality of flexible hoses, one on each of said manifolds, said hoses being connected at the other end to a rotating collector located above said bowl having a rotatable, liquid-tight connection with a stationary return pipe,
opening said valves,
causing introduction of hot washing liquid from said reservoir into said bowl to flow by gravity through said valves,
producing a pressure head in said manifolds sufficient to cause said valves and bowl to be flooded, and
recirculating said washing liquid through said manifolds, said hoses, said collector, said return pipe and said bowl.

4,414,037
STEAM JET CLEANING AND STERILIZING SYSTEM

Max Friedheim, 8652 LeBerthon St., Sunland, Calif. 91046

Continuation-in-part of Ser. No. 144,654, Apr. 28, 1980, abandoned. This application Jan. 4, 1982, Ser. No. 336,777
Int. Cl.³ B08B 3/02
U.S. Cl. 134—35 10 Claims



6. A method of cleaning and sterilizing, including pumping from a source of vaporizable liquid medium including water and/or mixtures of water and chemicals into a boiler, applying heat to the boiler and maintaining its temperature at a superheating value, metering the flow of liquid from a pump means into the boiler at a predetermined controlled rate relative to the temperature in the boiler, providing non-uniform internal boiler surfaces, discharging dry vapor from the boiler through jet nozzle means connected to it, at a pressure within a predetermined relatively high range, predetermining the size of the orifice in the jet nozzle means to limit discharge of vapor from the boiler, preventing flow of pressure from the boiler back to the pump means whereby pressure and temperature are held within the boiler so that liquid entering the boiler is flashed into steam and the boiler is maintained operating in a dry condition and discharging dry vapor within said pressure range for a predetermined number of seconds.

4,414,038

LASER BEAM SURFACE TREATMENT PROCESS FOR MATERIALS OF LARGE REFLECTIVITY

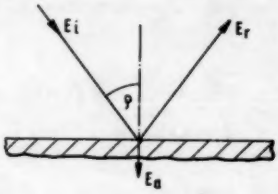
Friedrich Dausinger, Stuttgart; Werner Müller, Schwieberdingen, both of Fed. Rep. of Germany, and Peter Arnold, Westendstrasse 11, 8000 München 2, Fed. Rep. of Germany, assignors to Peter Arnold, Munich, Fed. Rep. of Germany

Filed Jul. 7, 1982, Ser. No. 396,138

Claims priority, application Fed. Rep. of Germany, Jul. 8, 1981, 3126953

Int. Cl.³ B23K *26/00*

U.S. Cl. 148—4 2 Claims



1. A process of surface heat treatment of work pieces by means of a laser beam, comprising the steps of:

directing said laser beam to impinge on the surface to be treated at an angle of incidence greater than 45°, said angle of incidence being defined as the angle between the axis of said laser beam and the perpendicular to said surface where it is intersected by the center of said laser beam, and

polarizing said laser beam linearly in a direction substantially parallel to the plane of incidence of the laser beam, thereby maximizing the portion of the laser beam energy absorbed by the work piece.

4,414,039

METHOD OF ACTIVATING TITANIUM SURFACES

Martin Thoma, Munich, Fed. Rep. of Germany, assignor to Motoren-und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Nov. 18, 1981, Ser. No. 322,585

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1981, 3133189

Int. Cl.³ C23F *7/24*

U.S. Cl. 148—6.2 11 Claims

1. A method of activating a titanium surface for subsequent cladding with a metallic coating comprising wet blasting a titanium surface with finely granular Al_2O_3, contacting the thus wet-blasted surface with a fluoride-containing solution for a period of a few minutes at room temperature, and activating said surface with a solution consisting essentially of chromic acid, hydrofluoric acid and hexafluosilicic acid in following molar ratios of the constituent elements:

$$7 \geq F/Si \geq 6$$

$$6 \geq Cr/Bi \geq 3$$

at a temperature of 35° to 100° C. for 15 to 50 minutes.

4,414,040

PASSIVATION OF MERCURY CADMIUM TELLURIDE SEMICONDUCTOR SURFACES BY OZONE OXIDATION

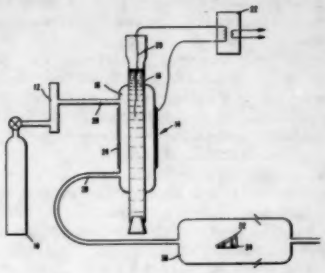
Robert E. Kvaas, Goleta, Calif., assignor to Santa Barbara Reserarch Center, Goleta, Calif.

Filed Aug. 20, 1981, Ser. No. 294,670

Int. Cl.³ C23C *11/00*

U.S. Cl. 148—6.3 7 Claims

1. A process for forming a native oxide on a semiconductor surface comprising $Hg_{1-x}Cd_xTe$, where x ranges from 0 to 1, which comprises exposing the semiconductor surface to a substantially water-free mixture of ozone and oxygen containing at least about 0.3 vol/vol percent ozone, said process carried out at a temperature within about ±10° C. of ambient temperature.



4,414,041

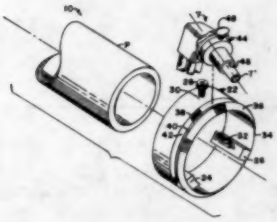
GUIDE SYSTEM FOR FLAME CUTTING OF PIPE

Richard W. Rusk, Rte. #1, Box 336, Simpson Dr., Waldorf, Md. 20601

Filed Jan. 22, 1982, Ser. No. 341,821

Int. Cl.³ B23K *7/04*

U.S. Cl. 148—9.6 9 Claims



1. In a system for precision angle-bevelling of an end of a pipe using a manually held gas cutting torch of the type having a torch tip aligned with a cutting flame of the gas cutting torch and having: track means, means for holding said track means coaxially on a pipe to be bevelled by a said gas cutting torch and means for guiding a said gas cutting torch around said track means under manual manipulation of said gas cutting torch, the improvement comprising: the track means including a sleeve with an end thereof bevelled at the same angle as said angle to be bevelled on a pipe, and said guiding means including means for positioning a said gas torch cutting tip in alignment with said sleeve bevelled-end, by riding on said sleeve bevelled-end.

4,414,042

METHOD OF MAKING HIGH STRENGTH STEEL TUBE

Heinz Gross, Dortmund; Friedrich Reith, Hamm; Friedhelm Retzlaff, Kamen-Methler, and Karl H. Schlusnus, Hamm, all of Fed. Rep. of Germany, assignors to Hoesch Werke Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Filed Dec. 26, 1979, Ser. No. 106,548

Claims priority, application Fed. Rep. of Germany, Jan. 2, 1979, 2900022

Int. Cl.³ C21D *8/10*

U.S. Cl. 148—12 R 1 Claim

1. A method of converting pre-rolled precipitation-hardenable fine-grain medium-carbon low alloy steel plates or strips into steel profiles having a yield strength of ≧500 N/mm², a

tensile strength of $\geqq 600$ N/mm^2 and high toughness, comprising the first step of cooling the rolled steel plates or strips from a final rolling temperature above the A_1-temperature level, down to a temperature of about 400° C. in an atmosphere which in part suppresses radiation and convection heat losses and thus reduces the cooling rate; the second step of thereafter cooling the steel plates or strips to room temperature; the third step of cold-processing the cooled steel plates or strips to form an open profile therefrom; the fourth step of subjecting the profile to annealing so as to dissolve coarse precipitants thereon; and the fifth step of cooling the profile to form finely dispersed precipitants therein; the first step of cooling comprising maintaining the steel plate in a furnace atmosphere during the cooling for overaging at high temperature; said third step comprising further the sixth step of converting the open profile into a tube by welding adjacent longitudinal edges of the profile together; said fourth step comprising further the seventh step of solution-annealing the profile above the A_{C3}-temperature; the eighth step of subjecting the tube to diameter reduction by longitudinal stretching at an initial stretch-pass temperature corresponding to said solution-annealing temperature; said fifth step comprising further the ninth step of cooling the profile subsequent to said annealing, and tenth step of interrupting the cooling at a temperature of 600° C. and continuing the cooling in the 500°–600° C. temperature range at reduced cooling speed to achieve a yield strength of 648 N/mm^2; the steel having a composition of:

0.28%	carbon
1.5%	manganese
0.32%	silicone
0.015%	sulfur
0.025%	phosphorous
0.03%	aluminum
0.12%	vanadium
0.015%	nitrogen,

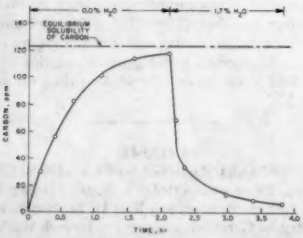
the balance being iron and impurities.

4,414,043

CONTINUOUS DECARBURIZATION ANNEALING WITH RECYCLE TO CONVERT CARBON MONOXIDE

Frank N. Davis, and Harry H. Podgurski, both of Greensburg, Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Jan. 22, 1982, Ser. No. 341,737
Int. Cl.^{3} C21D *1/48*
U.S. Cl. 148—16 **7 Claims**



1. In the continuous decarburization annealing of steel strip, wherein the strip is passed substantially horizontally through an elongated furnace and an annealing atmosphere containing H_2 and H_2O is flowed in a direction counter to the strip motion resulting in a build-up in the CO content of the atmosphere in the area where the strip enters the furnace, the atmosphere in said build-up area also containing H_2, N_2 and H_2O at temperatures of 1200° to 1600° F.,

the method for preventing said CO from increasing to a level at which the decarburization rate of the strip surface is materially decreased, comprising,

(a) at a first zone in the build-up area of the furnace, withdrawing an amount of said atmosphere,

(b) reacting said withdrawn atmosphere with H_2 in contact with a methanation catalyst to convert a substantial portion of the CO content therein to CH_4 and H_4O,

(c) introducing the reaction product into said furnace at a zone thereof downstream, with respect to the strip travel, of the first zone,

wherein the amount of atmosphere withdrawn in step (a) and the resulting reaction product introduced in step (c) are effective to decrease the CO content thereof to a level below which the decarburization rate is not materially decreased.

4,414,044

WATER-IN-OIL EMULSION EXPLOSIVE COMPOSITION

Fumio Takeuchi, and Masao Takahashi, both of Aichi, Japan, assignors to Nippon Oil and Fats, Co., Ltd., Tokyo, Japan

Filed Apr. 27, 1982, Ser. No. 372,131
Claims priority, application Japan, May 11, 1981, 56-69282; May 12, 1981, 56-70181; May 12, 1981, 56-70182
Int. Cl.^{3} C06B *45/00*
U.S. Cl. 149—2 **8 Claims**

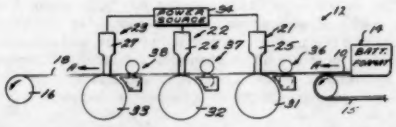
1. A water-in-oil emulsion explosive composition, comprising a disperse phase formed of an aqueous oxidizer solution consisting of (a) ammonium nitrate or a mixture of ammonium nitrate and sodium nitrate and (b) water; a continuous phase formed of a combustible material consisting of (c) fuel oil and/or wax; (d) at least one emulsifier selected from the group consisting of dipentaerythritol fatty acid ester, polyoxyalkylenedipentaerythritol fatty acid ester, sugar fatty acid ester and polyoxyalkylenesugar fatty acid ester; and (e) hollow microspheres or microbubbles.

4,414,045

HIGH SPEED ULTRASONIC BONDING

Kenneth Y. Wang, Greensboro, N.C.; Berlie R. Hill, Cana, Va., and Marvin J. Pinson, Jr., Greensboro, N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Feb. 22, 1982, Ser. No. 350,823
Int. Cl.^{3} B29C *27/08*; B32B *31/20*
U.S. Cl. 156—73.2 **20 Claims**



1. A method of producing a non-woven fabric from a batt of random, loose, ultrasonically fusible fibers utilizing a plurality of ultrasonic welding machines spaced from each other in a batt feed direction, the fabric having a predetermined number of primary bonding points per unit area formed with the ultrasonic welding machines, said method comprising the steps of:

(a) feeding the batt of fibers in the feed direction into operative engagement, in turn, with each of the ultrasonic welding machines;

(b) supplying energy to each of the ultrasonic welding machines to effect formation of primary bonding points therewith; and

(c) effecting bonding of substantially less than all of said predetermined number of primary bonding points per unit with each of the ultrasonic welding machines but so that together the machines provide all of said predetermined number of bonding points.

10. Apparatus for effecting the formation of a non-woven fabric from a batt of random, loose, ultrasonically fusible fibers, comprising:

a plurality of ultrasonic welding machines, each machine including at least one horn and an anvil roller;

means for mounting said welding machines so that they are spaced from each other in a direction of batt feed so that the batt may pass between the horn and anvil of each;

means for transporting the batt in the feed direction between the horns and anvil of each of said machines;

means for supplying energy, to effect ultrasonic bonding, to each of said machines at the same time; and

wherein each of said ultrasonic welding machines includes a plurality of horns, said horns of each machine being in-line with each other and spaced from each other in a dimension substantially transverse to said feed direction, and each horn of each machine is in cooperation with said anvil roller of said machine; and wherein the horns of at least one of said machines are staggered along said dimension substantially transverse to said feed direction with respect to the horns of at least one of the others of said machines, so that essentially every portion of the batt across the width thereof passes in operative association with at least one horn of at least one of said ultrasonic welding machines.

4,414,046

FRICTION WELDING

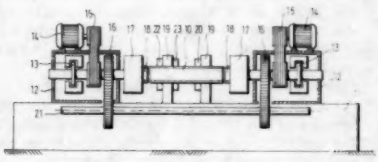
Bertram J. Palmer, Staffordshire, England, assignor to GKN Transmissions Limited, West Midlands, England

Filed Feb. 22, 1982, Ser. No. 351,014

Claims priority, application United Kingdom, Feb. 26, 1981, 8106087

Int. Cl.³ B23K *19/02;* B29C *27/08*

U.S. Cl. 156—73.5 **4 Claims**



2. A method of friction welding first and second components to respective ends of a third component, comprising holding said third component stationary, holding said first and second components at the ends of said third component, applying axial force thereto and rotating them in contact with said third component to produce welding conditions at the junctions therebetween, applying further axial force to said first and second components to produce welds with said third component, and braking said first and second components and releasing said third component substantially simultaneously with or immediately after commencement of application of said axial force, to permit said third component to rotate and be braked with said first and second components during production of said welds, with said third component being supported, during application of said welding force, solely by being held between said first and second components.

3. Apparatus for friction welding first and second components to respective ends of a third component, comprising releasable means for holding said third component stationary, means for holding said first and second components, means for driving said first and second components to rotate same, means for applying axially directed force to said first and second components while rotating to urge them into position with said third component and to apply a force thereto sufficient to cause welding of said components, means for braking said first and second components, and control means operable to cause release of said third component, by said holding means therefor, substantially simultaneously with operation of said means for braking and first and second components.

4,414,047

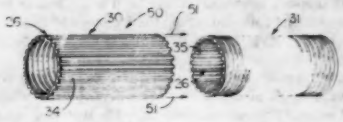
METHOD OF MAKING AN ENDLESS POWER TRANSMISSION BELT

Robert E. Wetzel, and Richard L. Marsh, both of Springfield, Mo., assignors to Dayco Corporation, Dayton, Ohio

Filed Jun. 11, 1981, Ser. No. 272,637

Int. Cl.³ B29H *7/22;* B32B *31/06*

U.S. Cl. 156—138 **14 Claims**



1. In a method of making an endless polymeric power transmission belt having a set of driving teeth on each of a pair of opposite surfaces thereof, said method comprising the steps of, forming a first belt portion which has a set of teeth extending from an outside surface thereof which defines one of said pair of opposite surfaces, helically winding a first load-carrying cord to define a part of said first belt portion, forming a second belt portion which has a set of teeth extending from an outside surface thereof which defines the other of said pair of opposite surfaces, bonding said belt portions together to define a belt sleeve having said first load-carrying cord therebetween, and cutting said belt sleeve to define said belt from a portion thereof, the improvement in said method wherein said step of helically winding said first cord comprises winding said first cord on a right hand helix along substantially cylindrical means of a given diameter to define a precise pitch line for said first belt portion, said first cord being disposed substantially outwardly of the completed first belt portion, and comprising the further steps of helically winding a second load-carrying cord on a left hand helix along substantially cylindrical means of said given diameter to define a part of said second belt portion and a precise pitch line therefor, said second cord being disposed substantially outwardly of the completed second belt portion, inverting one of said portions, and disposing said inverted portion concentrically around the other belt portion prior to said bonding step with the first and second cords having helical turns thereof of substantially identical size and arrangement disposed in an alternating manner across the width of said belt, said belt being adapted to be operated to provide a precision driving action employing the driving teeth on either belt portion thereof due to each belt portion having said first and second load-carrying cords on a precise pitch line.

4,414,048

WEB SPLICING APPARATUS

Robert F. Kontz, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed May 7, 1981, Ser. No. 261,303

Int. Cl.³ B31F *5/06;* B65H *21/00*

U.S. Cl. 156—159 **8 Claims**

1. An apparatus for splicing webs from separate web rolls comprising

means defining a substantially horizontal splicing station across which a web from one roll is moved,

a vertically movable brake movable downwardly for engaging the web to momentarily interrupt the web,

a movable knife blade,

means for guiding the movable knife blade for movement from a first position above the web to a second position below the web,

detent means for holding the movable knife blade in said first position above the web,

a fixed knife blade associated with said splicing station beneath the web,

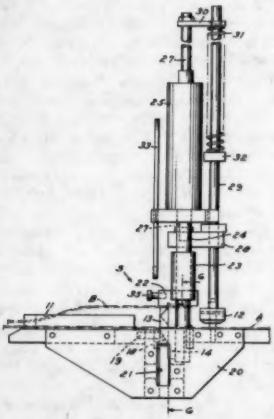
a vertically movable bar above said movable knife for holding the taped end of a web from a second roll in position between the movable knife blade in its first position and said bar disposed above the web from the first roll, said bar operable for driving said movable knife downwardly to its second position below the web and carrying the tape and second web to the first web,

and drive means for moving said brake into engagement with said web and moving said bar to drive said movable knife blade, thereby severing the trailing end of the web from the first roll, and taping the leading end of the second roll to the severed end of the first roll in a butt splice thereof,

said apparatus including a transverse opening so that the movable knife blade may be manually removed while at its said second position after severing the web and inserted to its first position above the second web for a subsequent similar splicing of the second web to another roll.

4. An apparatus for splicing webs from two separate web rolls comprising

means defining a splicing station across which a web from one roll is moved,



a brake shiftable toward the moving web for engaging the web to momentarily interrupt its movement across the splicing station,

a movable knife blade,

guide means defining the path of movement for said knife blade from a first position on one side of the web to a second position on the other side of the web whereat said knife blade is free of said guide means,

yieldable means for holding said knife blade in said first position,

a fixed knife blade associated with said splicing station on other side of the web cooperating with the movable knife blade to sever the web,

bar means on the one side of the web at the splicing station adapted for holding the taped end of a web from a second roll in position, the movable knife blade in its first position holding said taped end against the bar means and adapted for movement toward said first web together by movement of said bar means in that direction,

and means for operating said bar means driving said movable knife blade from its first position to its second position to sever the trailing end of the web of the first roll, and concurrently therewith and, in succession with such severing action, tape the leading end of the web of the second roll to the severed end of the first roll thereby providing a butt splice of the two ends,

said movable knife blade being free for removal from the guide path after being actuated to its said second position.

4,414,049

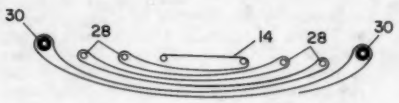
METHOD OF MANUFACTURE OF AN ENERGY ABSORBING BEAM

Brian H. Jones, San Gabriel, Calif., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed Sep. 25, 1981, Ser. No. 305,753

Int. Cl.³ B65H *81/00*

U.S. Cl. 156—166 **2 Claims**



1. In a method of forming a resin impregnated pre-form for the manufacture of a composite energy absorbing beam the steps of:

(a) providing a fixture positioning first and second end bushings, said fixture including a plurality of pin means extending between said first and second end bushings defining a predetermined curve therebetween;

(b) selecting one of said pin means as an anchor pin;

(c) sequentially winding a tow of continuous resin impregnated fibers in a pattern about said pins commencing with said anchor pin and extending to a first next adjacent pin thereto wrapping said tow about said first next adjacent pin thereby reversing direction of said tow toward said anchor pin, winding said tow past and radially outward of said anchor pin to a second next adjacent pin wrapping said tow about said second next adjacent pin thereby reversing direction of said tow toward said anchor pin, winding said tow past and radially outward of said anchor pin and said first adjacent pin advancing to the next positioned pin wrapping said tow thereabout reversing direction of said tow toward said anchor pin, winding said tow past and radially outward of the prior wrapped pins to the next progressively positioned pin wrapping said tow thereabout reversing direction of said tow toward said anchor pin, continuing the winding pattern until all pins and the end bushings are wrapped by said tow.

4,414,050

METHOD AND APPARATUS FOR JOINING VENEER STRIPS

Oskar Bernath, Umiken, Switzerland, assignor to Georg Fischer Brugg-Oehler AG, Switzerland

Filed May 11, 1982, Ser. No. 377,075

Claims priority, application Switzerland, May 21, 1981, 3313/81

Int. Cl.³ B27D *1/10, 3/04*

U.S. Cl. 156—166 **9 Claims**

1. A method for joining a plurality of veneer strips into a panel so that abutting edges of the strips are generally parallel with the direction of the wood grain using adhesive strings, comprising the steps of

extending a portion of at least one adhesive string across one major surface of a first veneer strip in a direction perpendicular with the strip grain;

forming a loop at a side edge of the strip so that the string extends beyond the opposite surface of the first strip and back;

moving a second strip into contiguous abutting relationship with the first so that the loop is caught between the side edges;

bending the exposed portion of the loop onto the opposite

surface of one of the contiguous strips, and pressing the loop portion to adhere it to said opposite surface;

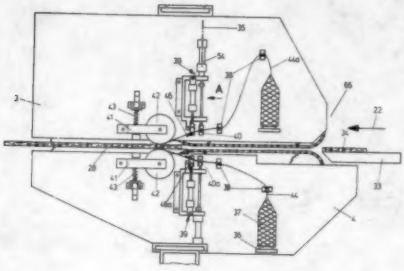
extending the adhesive string across the major surface of the second strip lying in the same plane as the one major surface of the first strip; and

repeating the steps of forming loops, moving additional strips into contiguous relationship, and bending exposed portions of the loops to form a panel in which each string extends across only one panel surface.

4. An apparatus for joining a plurality of veneer strips into a panel comprising

means for supporting and moving a plurality of veneer strips;

means for holding a supply coil of adhesive string;



means for extending a portion of said adhesive string from said coil across a major surface of a first veneer strip in a direction perpendicular with the grain thereof;

means for forming a loop at a side edge of said first strip so that the string extends beyond the opposite surface of said first strip and back;

means for moving a second strip so that its edge is in contiguous abutting relationship with said edge of said first strip so that the loop thus formed is caught between the strip edges; and

heated roller means for bending the exposed portion of the loop onto said opposite surface of one of said strips to adhere it to said surface, said means for extending being usuable to place said string across the plane-parallel major surface of the second and subsequent strips between loops formed between contiguous edges thereof, in sequence.

4,414,051

METHOD FOR SLITTING AND/OR SEALING PLASTIC FILM MATERIAL

Ajit Bose, Rexdale, Canada, assignor to Leco Inc., Rexdale, Canada

Filed Mar. 29, 1982, Ser. No. 363,074
Int. Cl.³ B29C *17/00, 19/00*
U.S. Cl. 156—198 **4 Claims**

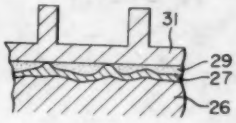
1. A method for forming two or more smaller tubes of blown film from a larger single tube of blown tube of a greater diameter than the smaller tubes comprising the steps of extruding said larger tube by the blown-tube process, and, after said tube is formed collapsing said tube, and, but prior to winding up said collapsed tube into rolled tubing, severing and sealing said larger collapsed tube in the axial or lengthwise direction of movement of said tube by contacting said tube with a beam generated by a laser while controlling the temperature of the beam at the surface of the film to a point sufficient only to raise the enthalpy of the material of the tube to the transition point between the molten and solid states of said material, whereby said laser beam severs and seals said larger diameter tube into two or more smaller diameter tubes with axial or longitudinal seams of substantially similar thickness to the thickness of the layers of film comprising said blown tube and in which the real strength of the seal is greater than a similar corresponding hot-knife seal.

4,414,052

POSITIVE-TEMPERATURE-COEFFICIENT THERMISTOR HEATING DEVICE

Etsuroh Habata, Ikoma; Nobumasa Ohshima, Hirakata, and Kenji Kanatani, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 23, 1981, Ser. No. 333,917
Claims priority, application Japan, Dec. 26, 1980, 55-186490; Dec. 26, 1980, 55-186494
Int. Cl.³ B32B *31/20*; H01C *7/02*; H05B *3/30*
U.S. Cl. 156—273.7 **3 Claims**



2. A process for fabricating positive-temperature-coefficient thermistor heating devices characterized by

(a) preparing an adhesive which is electrically insulative and has a curing temperature equal to or in the proximity of a Curie point of a positive-temperature-coefficient thermistor element having electrodes formed over the opposite major surfaces thereof;

(b) applying layers of said adhesive over the surfaces of said electrodes, respectively, of said positive-temperature-coefficient thermistor element;

(c) placing heat radiating means, which are made of a metal thereof, over and pressing them against said electrodes of said positive-temperature-coefficient thermistor element with said layers of said adhesive therebetween in such a way that direct contacts without interposition of said adhesive can be at least partially established between said electrodes of said positive-temperature-coefficient thermistor element and said heat radiating means; and

(d) while maintaining the state as defined in said step (c), applying a voltage across said positive-temperature-coefficient thermistor element to thereby heat it to temperatures close to said Curie point thereof, thereby thermally curing said layers of said adhesive to bond between said positive-temperature-coefficient thermistor element and said heat radiating means, said heat radiating means functioning as current paths, respectively, to and out of said positive-temperature-coefficient thermistor element.

4,414,053

POLYMER BLENDS AND EASY-PEEL FILMS PREPARED THEREFROM

Khalid A. Karim, and James H. Rea, both of Houston, Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Dec. 6, 1982, Ser. No. 447,230
Int. Cl.³ C08L *33/04, 23/08*
U.S. Cl. 156—308.2 **8 Claims**

1. A polymer composition consisting essentially of:

(a) 100 parts by weight of an ethylene copolymer, and

(b) About 1 to 5 parts by weight of a polymer of a higher alkyl ester of acrylic or methacrylic acid;

said ethylene copolymer having polymerized therein about 70–98 weight % of ethylene and the balance an alkyl ester of acrylic or methacrylic acid; said polymer of a higher alkyl ester of acrylic or methacrylic acid being a homopolymer of said ester or a copolymer of said ester with ethylene in which the copolymer contains at least 25 weight % of said ester; the alkyl group of said ester containing about 8 to about 24 carbon atoms.

4,414,054

PORTABLE LABELING MACHINE

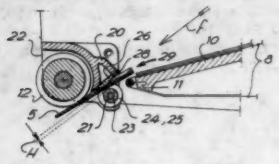
Werner Becker, Hirschhorn, and Heinz Kistner, Neckarsteinach, both of Fed. Rep. of Germany, assignors to Esselte Pendaflex Corporation, Garden City, N.Y.

Filed Jul. 2, 1982, Ser. No. 394,523

Claims priority, application Switzerland, Feb. 18, 1982, 1008/82

Int. Cl.³ B65C *11/02*

U.S. Cl. 156—384 **6 Claims**



1. A portable labeling machine comprising a housing (**1**) provided with a grasping handle (**2**), a control lever (**3**) located below the handle, a printing device (**4**) connected to the lever for printing, upon each pull on the lever, selected characters onto a label of a continuous strip (**6**) formed of a series of self-adhesive labels (**5**) borne by a common support strip (**8**), a device (**7**) for the step-by-step driving of the said continuous strip, which device is also connected to the control lever so as, upon each release of the latter, to cause the advance of said continuous strip by a step corresponding to the length of one label along an inner circuit comprising a hairpin curve which forms a separating edge (**11**), whereupon each printed label is separated, at least in part, from the support strip and placed below a pressure roller (**12**) borne by the housing, towards the outside of the latter, to permits its attachment by gluing pressure onto the article to be labeled, and in which there is provided a device for the cambering of said label, intended to maintain it so as to prevent the falling thereof after its separation from the support strip and before its pressure gluing, characterized by the fact that the label cambering device comprises three elements one of which is formed of the pressure roller (**12**) itself and the other two by two cambering guides (**20, 21**) extending transversely opposite each other, one above and one below the exit path of the printed label, which guides have complementary camber profiles and between them form the envelope of an imposed curvilinear passage (**27**) of a height (H) and width (L) which are greater than the thickness and width respectively of the labels, said passage having a flared entry (**29**) and being arranged between the pressure roller (**12**) and the separating edge (**11**) in order to camber the label parallel to the direction of its displacement and towards the side opposite the pressure roller, and by the fact that the generatrix (G) of contact of this pressure roller with the label is located at the highest at the level of a plane (T) tangent to the cambered portion (B) of the label.

4,414,055

MACHINE FOR APPLYING BASE CUPS TO BOTTLES

William P. Young, Farmington, Mich., assignor to William P. Young Co., Farmington, Mich.

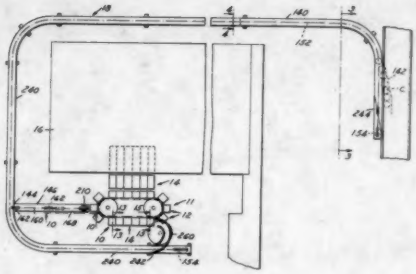
Division of Ser. No. 103,566, Dec. 14, 1979, Pat. No. 4,312,439. This application Jun. 13, 1980, Ser. No. 159,127

Int. Cl.³ B29D *3/00*

U.S. Cl. 156—423 **9 Claims**

1. A machine for applying base cups to bottles, comprising a conveyor movable along a predetermined path and having a series of support units each comprising a bottle holder having means for holding a bottle securely and firmly in an upright position and a base cup seat for holding a base cup upright supported beneath said bottle holder for movement toward and away from the bottom of a bottle held by said bottle holder, means for loading bottles upright on said respective bottle holders, means for applying adhesive to the inside of said base cups, means for holding said base cups upright and with adhesive applied thereto on said respective base cup seats, and means downstream from said bottle and base cup loading means in the direction of conveyor movement for elevating said base cup seats to apply and adhere the base cups held thereby to the bottles while the bottles are held securely and firmly as aforesaid by the bottle holders thereabove.

5. A machine for applying base cups to bottles, comprising a conveyor movable along a predetermined path and having a series of support units each comprising a bottle holder for holding a bottle upright and a base cup seat for holding a base cup upright supported beneath said bottle holder for movement toward and away from the bottom of a bottle held by said bottle holder, each bottle holder comprising means engageable with the body of a bottle and means engageable with the neck of a bottle, said neck engaging means comprising a member having an open slot of generally U-shape for closely receiving the neck of a bottle, said member being of a flexible, compressible material capable of holding the neck of a bottle with a friction grip, means for loading bottles upright on said respective bottle holders, means for loading base cups upright on said respective base cup seats, and means downstream from said bottle and base cup loading means in the direction of conveyor movement for elevating said base cup seats to apply the base cups held thereby to the bottles held by the bottle holders thereabove.



4,414,056

METHOD AND APPARATUS FOR FOIL-CAPPING BOTTLES

Rainer Buchholz, Düsseldorf; Josef Tomashauser, Tönisvorst; Rudolf Zodrow, Düsseldorf, and Hans-Werner Mohn, Kaarst, all of Fed. Rep. of Germany, assignors to Jagenberg Werke AG, Düsseldorf, Fed. Rep. of Germany

Filed Oct. 23, 1981, Ser. No. 314,335

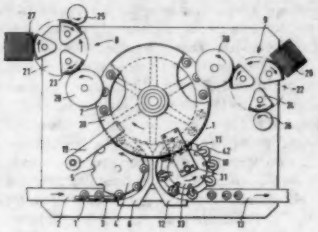
Claims priority, application Fed. Rep. of Germany, Dec. 11, 1980, 3046615; Feb. 11, 1981, 3104807

Int. Cl.³ B65C *3/22*

U.S. Cl. 156—476 **29 Claims**

1. In an apparatus for the foiling of bottles with a patch, having at least one point, comprising a turntable which has several controlled bottle turning means disposed at its periphery, at least one labeling station which transfers the foil patches to the bottles moved past it by the turntable and brought to a certain rotational position by the bottle turning means, elements for pressing down the foil patches transferred to the bottles, the elements being disposed along the transport path of the bottles, and a transfer wheel disposed after the turntable and provided with receiving places for the bottles, the transfer wheel having a clamping means for the bottles and means for turning and pressing down patch ends projecting above the tops of the bottles, the improvement which comprises clamping means holding the bottles against rotation on the entire transport by the transfer wheel, the turning and pressing means

including a plurality of units disposed above the transfer wheel and turning with the transfer wheel, each unit being associated with one receiving place, means for pivoting each unit in coordination with the rotational movement of the transfer wheel from a first position laterally alongside the corresponding receiving place to a second position over the corresponding receiving place, means for lowering each unit in its second position axially against the top of a bottle held in the receiving place, a fold-down device, and a smoothing and pressing element disposed behind the fold down device in the direction of pivoting from the first position to the second position and, when lowered, gripping the bottle top on all sides.



4,414,057

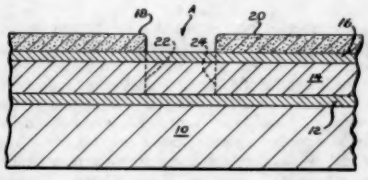
ANISOTROPIC SILICIDE ETCHING PROCESS

Ronald R. Bourassa, and Michael R. Reeder, both of Colorado Springs, Colo., assignors to Inmos Corporation, Colorado Springs, Colo.

Filed Dec. 3, 1982, Ser. No. 446,597

Int. Cl.[3] **H01L** *21/306;* **C03C** *15/00;* **B44C** *1/22;* **C23F** *1/02*

U.S. Cl. 156—643 **16 Claims**



1. A process for etching selected materials in a layered semiconductor product having a lower layer, an intermediate layer, and an upper silicide layer, the process comprising the steps of:

exposing the semiconductor product to a first gas consisting essentially of C_2ClF_5 at reduced pressure for a time sufficient for said first gas to etch through the silicide layer; and

exposing the semiconductor product to a second gas comprising Cl_2 at reduced pressure for a time sufficient for said second gas to etch through the intermediate layer.

4,414,058

METHOD FOR PRODUCING DYNAMIC SEMICONDUCTOR MEMORY CELLS WITH RANDOM ACCESS (RAM) BY DOUBLE POLYSILICON GATE TECHNOLOGY

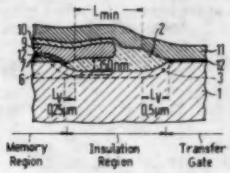
Wolfgang Mueller, Putzbrunn, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 13, 1982, Ser. No. 449,145

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1982, 3205858

Int. Cl.[3] **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—643 **12 Claims**



1. In a method for manufacturing dynamic semiconductor memory cells with random access in accordance with the double polysilicon gate technology having a first polysilicon level (**9**) applied insulated onto a semiconductor body (**1**) as a memory electrode for the memory regions generated in said semiconductor body and having a second polysilicon level (**11**) applied insulated from said first polysilicon level (**9**) as word lines, with which the insulation of adjacent, active regions occurs by thick oxide regions (**2**) generated according to known LOCOS technology and with which, for increasing cell capacity, a flat arsenic implantation region (**7**) and a deep boron implantation region (**6**) are generated in the memory region with the use of a photoresist mask (**4**), the improvement comprising:

positioning a photoresist mask edge (**4***a*) in the center of the thick oxide regions (**2**) located between memory cells and thick oxide transistors; and

reducing the thickness of the oxide in the memory regions, both axially and laterally, at the junctions between thick oxide regions (**2**) and thin oxide regions (**2***a*) by etching.

4,414,059

FAR UV PATTERNING OF RESIST MATERIALS

Samuel E. Blum, White Plains; Karen H. Brown, Yorktown Heights, and Rangaswamy Srinivasan, Ossining, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 9, 1982, Ser. No. 448,126

Int. Cl.[3] **B44C** *1/22;* **C03C** *15/00, 25/06;* **B05D** *3/06*

U.S. Cl. 156—659.1 **17 Claims**

1. In a thin film fabrication process for producing a device or circuit, the steps as follows:

providing a substrate including at least one layer therein,

depositing a resist layer on said substrate,

removing selected areas of said resist layer by irradiation of said selected areas with ultraviolet light of wavelengths less than 220 nm and having a sufficient power density to

produce ablative photodecomposition of said irradiated areas to expose portions of said substrate, and

causing a change to said exposed portions of said substrate through said patterned resist layer.

4,414,060

METHOD FOR SULFITE PULPING USING WATER-SOLUBLE MOLYBDENUM CONTAINING COMPOUNDS

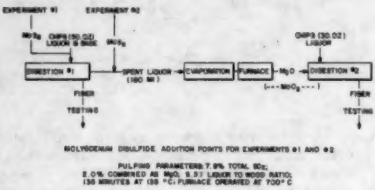
Dominic S. Rende, Woodridge, Ill., assignor to Nalco Chemical, Oak Brook, Ill.

Continuation-in-part of Ser. No. 216,749, Dec. 16, 1980, abandoned. This application Jan. 8, 1982, Ser. No. 337,808

The portion of the term of this patent subsequent to Aug. 31, 1999, has been disclaimed.

Int. Cl.³ D21C *3/04, 11/02*

U.S. Cl. 162—36 **3 Claims**


EXPERIMENT #1
EXPERIMENT #2
DIGESTION #1
SPENT LIQUOR
EVAPORATION
FURNACE
DIGESTION #2
FIBER TESTING
FIBER TESTING
MOLYBDENUM DISULFIDE ADDITION POINTS FOR EXPERIMENTS #1 AND #2
PULPING PARAMETERS: 7.9% TOTAL SO₂; 2.0% COMBINED AS Na₂O, 5.3:1 LIQUOR TO WOOD RATIO; 150 MINUTES AT 150 °C; FURNACE OPERATED AT 700° C

1. An improved process for sulfite pulping of wood of the type which comprises sulfite pulping wood chips in the presence of a catalytic amount of a water-soluble molybdenum containing compound, the improvement which comprises adding to the spent liquor stream in the sulfite pulping process a catalytically effective amount of molybdenum disulfide, feeding the spent liquor stream into an evaporator and recovery furnace, heating the stream to evaporate excess liquid, and oxidizing said molybdenum sulfide to recover molybdenum oxides, and then returning these molybdenum oxides to a digester wherein the molybdenum oxides act as catalysts to accelerate the acid hydrolysis of wood lignins.

4,414,061

TWIN WIRE PAPER FORMING APPARATUS

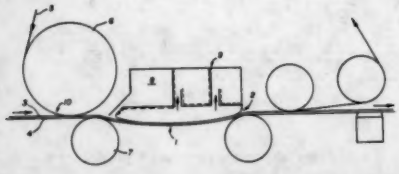
Alton D. Trufitt, Eltham, Australia, and David J. Bringman, Bolton, England, assignors to Australian Paper Manufacturers Limited, South Melbourne, Australia and Beloit Corporation, Beloit, Wis.

Continuation of Ser. No. 2,075, Jan. 3, 1979, abandoned, which is a continuation of Ser. No. 792,983, May 2, 1977, abandoned. This application Sep. 28, 1981, Ser. No. 305,868

Claims priority, application Australia, Feb. 20, 1975, PC0668; United Kingdom, May 4, 1976, 18077/76

Int. Cl.³ D21F *1/48*

U.S. Cl. 162—295 **4 Claims**



1. Apparatus for forming a paper web from a dilute, aqueous slurry of fibers comprising, in combination:

a looped upper forming wire;

a looped lower forming wire;

means for supporting the upper and lower forming wires in opposed, substantially horizontal relationship for receiving an aqueous slurry of fibers to be dewatered therebetween;

a stationary dewatering device mounted within the looped upper forming wire and including

(a) an autoslice mounted in water skimming relationship with the upper forming wire for urging the water into the autoslice for removal therefrom, said autoslice being capable of applying sub-atmospheric pressure to the water;

(b) a suction box having a convexly curved pervious working surface with a radius between about 50 inches to about 400 inches and mounted within the looped upper forming wire positioned closely adjacent and downstream of the autoslice with the working surface bearing downwardly against the upper forming wire to cause the upper and lower forming wires to define a smooth upwardly concavely curved path over the working surface throughout at least a portion of their substantially horizontal path of travel, whereby a significant amount of water is removed upwardly from the aqueous slurry of fibers through the upper forming wire over the curved pervious working surface to form the paper web;

first and second means positioned within the lower forming wire substantially upstream and downstream, respectively, of the stationary dewatering device for creating negative pressure beneath the lower forming wire.

4,414,062

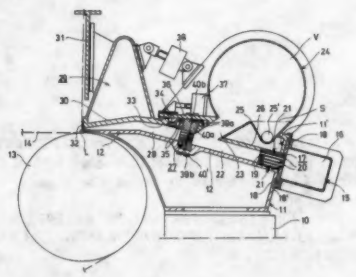
HEADBOX OF A PAPER MACHINE

Alvi Kirjavainen, Jyväskylä, Finland, assignor to Valmet OY, Finland

Filed Nov. 18, 1981, Ser. No. 322,587

Int. Cl.³ D21F *1/06*

U.S. Cl. 162—336 **8 Claims**



1. In a headbox of a paper machine having a stock distribution header part; a distribution pipe assembly following and communicating with said stock distribution header part in the direction of the stock flow; and a stock suspension flow passage downstream of and following said distribution pipe assembly having upper and lower wall means and including means defining an equalizing passage communicating with and following said distribution pipe assembly in the flow path of the stock suspension with an air tank in direct communication with said equalizing passage for damping pressure pulsations occurring in the stock flow, a turbulence section downstream of and communicating with said equalizing passage, and a converging slice part communicating with and following said equalizing passage in the direction of stock flow, said converging slice part having a lower lip wall and an upper lip wall, and wherein at least said turbulence section is constituted by at least one exchangeable grating cassette component removably attached to the headbox, the improvement comprising:

said turbulence section includes two grating plates situated against each other extending transverse to the direction of stock flow, the first of the two plates having a plurality of first bores formed therethrough and the second of the two

plates having a corresponding plurality of second bores formed therethrough, each of said second bores being coaxial with a respective one of said first bores and having a larger diameter than that of said respective first bore to form a step therebetween, and wherein said grating plates constitute mechanical supporting and load-bearing means between said upper and lower wall means of said stock suspension flow passage for taking up forces acting on said upper and lower wall means of said stock suspension flow passage.

4,414,063

REMOVING RESIDUAL ACRYLONITRILE IN AQUEOUS DISPERSIONS

Robert A. Smiley, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Apr. 12, 1982, Ser. No. 367,755
Int. Cl.³ B01D *3/36*; C08F *6/10*
U.S. Cl. 203—66 **5 Claims**

1. A process for the removal of residual acrylonitrile in acrylonitrile polymers in aqueous emulsion comprising adding at least about 1.5 parts by weight of methanol for each part by weight of acrylonitrile in said emulsion said methanol being in a form that will not break the emulsion and thereafter distilling off a methanol-acrylonitrile azeotrope until the concentration of acrylonitrile in the polymer and emulsion is less than about 10 ppm.

4,414,064

METHOD FOR PREPARING LOW VOLTAGE HYDROGEN CATHODES

John Z. O. Stachurski, Amherst; Dirk Pouli, Williamsville; John A. Ripa, Lancaster, and Gerald F. Pokrzyk, Lewiston, all of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Division of Ser. No. 104,235, Dec. 17, 1979, Pat. No. 4,354,915.
This application Nov. 19, 1980, Ser. No. 208,357
Int. Cl.³ C25D *5/50*; C25B *11/10*; H01M *4/88*; B05D *5/12*
U.S. Cl. 204—37 R **16 Claims**

1. A method for applying an activated cathode surface to a substrate to form a cathode useful in electrolytic processes, said method comprising the steps of:

(a) electrodepositing a coating of a first metal selected from the group consisting of iron, cobalt, nickel, and mixtures thereof, a leachable second metal or metal oxide selected from the group consisting of molybdenum, manganese, titanium, tungsten, vanadium, indium, chromium, their oxides, and combinations thereof, and a nonleachable third metal selected from the group consisting of cadmium, mercury, lead, thallium, bismuth, and mixtures thereof, onto the substrate material from an aqueous plating solution until said coating covers at least a portion of said substrate material, and

(b) removing at least a portion of the leachable second metal.

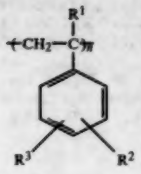
4,414,065

METHOD FOR PREPARING A CHLORINATED VINYL AROMATIC POLYMER

Hiroyuki Watanabe, Shin-nanyo, Japan, assignor to Toyo Soda Manufacturing Co., Ltd., Shin-nanyo, Japan

Filed Aug. 13, 1982, Ser. No. 407,945
Claims priority, application Japan, Sep. 9, 1981, 56-140905
Int. Cl.³ C25B *3/06*
U.S. Cl. 204—81 **17 Claims**

1. A method for preparing a chlorinated vinyl aromatic polymer, which comprises: admixing a vinyl aromatic polymer represented by the formula:



where R^1, R^2 and R^3 may be the same or different and each represents hydrogen or a C_1–C_6 lower alkyl group, and

n is an integer from 50 to 30,000 with an organic solvent which will dissolve said polymer; and

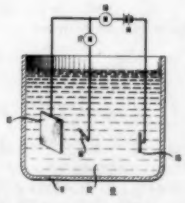
subjecting said polymer to an electrolytic reaction in the presence of an aqueous solution containing chlorine ions.

4,414,066

ELECTROCHEMICAL PHOTOETCHING OF COMPOUND SEMICONDUCTORS

Stephen R. Forrest; Paul A. Kohl, both of Chatam, and Richard L. Panock, Cranford, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 10, 1982, Ser. No. 416,472
Int. Cl.³ C25F *3/12*
U.S. Cl. 204—129.3 **26 Claims**



1. A process for fabricating a device comprising at least one intrinsic or n-type compound semiconductor comprising the step of electrochemically photoetching at least part of the surface of the compound semiconductor to produce oxidized species by passing current through the compound semiconductor, an electrolytic solution with conductivity greater than 0.0001 mhos/cm and a cathode characterized in that the step further comprises

a. applying a potential to the semiconducting compound which is between the maximum potential of the valence band of the semiconductor compound in the electrolytic solution and the minimum potential of the conduction band of the semiconductor compound in the electrolytic solution;

b. illuminating the part of the surface of the compound semiconductor to be etched with radiation of sufficient energy to produce holes in the valence band;

c. including in the composition of the electrolytic solution species which remove the oxidized species from the surface of the compound semiconductor.

4,414,067

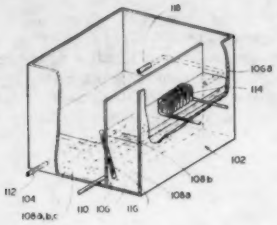
VAPOR CONDENSATE RETURN MEANS IN A VAPOR GENERATING AND RECOVERY APPARATUS

James W. McCord, 9101 Nottingham Pkwy., Louisville, Ky. 40222

Continuation of Ser. No. 334,169, Dec. 24, 1981, Pat. No. 4,394,216. This application Apr. 28, 1983, Ser. No. 489,490

Int. Cl.³ B01D *3/02, 11/02*

U.S. Cl. 202—170 **12 Claims**



1. A vapor generating and recovery apparatus comprising:

a housing having a vaporizing chamber and a condensing chamber therein separated by a first weir of preselected height;

means to add heat to said vaporizing chamber and means to remove heat from said condensing chamber; and,

means for minimizing the amount of additional fluids normally required for operation of said apparatus, by maintaining the composition of a solution comprising a first component and a second component immiscible with, and of higher density than said first component, including

first means to transfer condensed second component from said condensing chamber to said vaporizing chamber, and

second means to transfer condensed first component from said condensing chamber to said vaporizing chamber with sufficient force to provide mixing sufficient to cause substantial thermal equilibrium between said first and second components.

4,414,068

SELF-CURABLE RESINOUS COMPOSITIONS USEFUL IN COATING APPLICATIONS

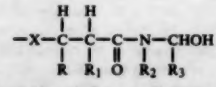
Steven E. Patricca, Pittsburgh, and Stephen L. Buchwalter, Allison Park, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 175,163, Aug. 4, 1980, Pat. No. 4,341,676. This application Mar. 11, 1982, Ser. No. 357,025

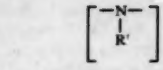
Int. Cl.³ C25D *13/06*

U.S. Cl. 204—181 C **15 Claims**

1. In an improved process for cathodically electrocoating an electrically conductive surface serving as a cathode which comprises passing an electric current between said cathode and an anode which are immersed in an aqueous resinous dispersion containing an aqueous resinous composition wherein the improvement comprises a polymer characterized by a pendant group which is of the structure:



wherein X represents sulfur or an amino group



of which R' is hydrogen or an alkyl group containing from about 1 to 6 carbon atoms; and wherein R, R_1, R_2 and R_3, each independently, is hydrogen or an alkyl group containing from about 1 to 6 carbon atoms; said composition also comprises a water-solubilizing group.

4,414,069

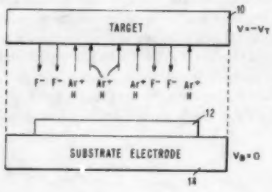
NEGATIVE ION BEAM SELECTIVE ETCHING PROCESS

Jerome J. Cuomo, Lincolndale, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1982, Ser. No. 393,838

Int. Cl.³ C23C *15/00;* **C23F** *1/00*

U.S. Cl. 204—192 E **27 Claims**



1. In a negative ion etching process, wherein negative ions are sputtered from a target by a sputtering plasma and then are accelerated to a substrate to cause etching therefrom, the improvement wherein hydrogen or a species containing hydrogen is added to said sputtering plasma.

4,414,070

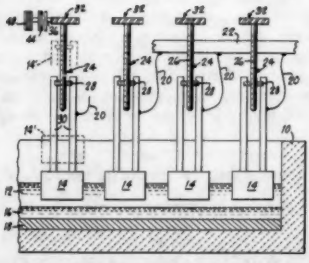
ANODE POSITIONING SYSTEM

John S. Spence, Arvida, Canada, assignor to Alcan International Limited, Montreal, Canada

Filed Feb. 12, 1982, Ser. No. 348,170

Int. Cl.³ C25D *17/00*

U.S. Cl. 204—225 **12 Claims**



1. An anode positioning system for an electrolytic cell having multiple suspended anodes, comprising:

(a) a plurality of screw jacks each adapted to raise and lower one anode;

(b) a corresponding plurality of reduction gear means with outputs respectively connected to said screw jacks for individually driving said jacks;

(c) means including a motor for bidirectionally driving said plurality of reduction gear means; and

(d) means for transmitting drive from said driving means to

said plurality of reduction gear means including a corresponding plurality of slipping frictional clutches respectively interposed between said driving means and said plurality of reduction gear means such that each of said gear means has an individual frictional clutch associated therewith.

4,414,071
ELECTRODE

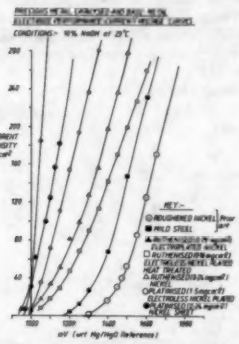
Donald S. Cameron, Reading, and Susan J. Cooper, Finchampstead, both of England, assignors to Johnson, Matthey & Co., Limited, London, England

Filed Apr. 15, 1981, Ser. No. 254,494

Claims priority, application United Kingdom, Apr. 22, 1980, 8013146

Int. Cl.³ C25B *11/10, 1/34*

U.S. Cl. 204—242 **5 Claims**



1. A cathode suitable for use in a chloralkali process, the cathode comprising an electrolytic deposit of platinum and ruthenium having a roughness factor of at least 100 cm^2/cm^2 of geometric surface area, wherein the deposit is carried on an electrically conductive matrix and is selected from a group consisting of mixtures or alloys of platinum and ruthenium.

5. A chloralkali cell incorporating a cathode as claimed in claim 1.

4,414,072
DOOR FOR COKING CHAMBER OF COKE-OVEN BATTERY

Dieter Breidenbach, Waltrop, and Wilhelm Mosebach, Kamen-Mettheler, both of Fed. Rep. of Germany, assignors to WSW Stahl-und Wasserbau GmbH, Waltrop, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 303,609, Sep. 18, 1981, which is a division of Ser. No. 182,004, Aug. 27, 1980, abandoned. This application Dec. 18, 1981, Ser. No. 332,317

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1979, 2945017; Jan. 4, 1980, 3000161

Int. Cl.³ C10B *25/06, 29/04*

U.S. Cl. 202—248 **6 Claims**

1. A door for a coking chamber of a coke oven battery provided with a doorjamb at the narrow ends of the chamber between two major parallel chamber walls comprising:

a door frame sealingly engaging said doorjamb;

support means having an outer end thereof mounted on said doorframe and having an inner end thereof extending into an associated coking chamber fitted with said door;

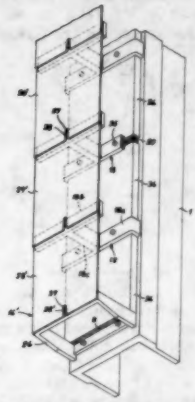
a thermally conductive metal plate arranged and constructed to:

be mounted on said support means at the inner end thereof,

be spaced from said door frame to define therewith a vertical channel,

provide access to said channel by heated gases entering said channel from a charge of coal in said coking chamber,

permit said heated gases entering said channel to flow upwardly therein and transfer a considerable part of the heat of said gases through said metal plate to the coal



charge in said chamber at the normally unheated end thereof adjacent said metal plate; and

a heat insulating layer on said frame extending over substantially the full width and height thereof for minimizing the escape of heat from said gases to the exterior of said frame.

4,414,073
SUPPORTING BODY CELL IN ELECTROPHORETIC APPARATUS

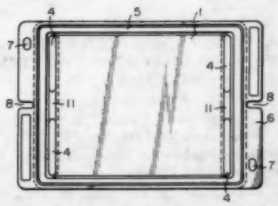
Toyotaro Iwata, Kobe; Kunio Nakajima, Miki, and Hiroyuki Otsuki, Kakogawa, all of Japan, assignors to Toa Medical Electronic Co., Ltd., Hyogo, Japan

Filed Sep. 16, 1982, Ser. No. 419,034

Claims priority, application Japan, Sep. 18, 1981, 56-147164

Int. Cl.³ G01N *27/28*

U.S. Cl. 204—299 R **10 Claims**



1. A cell for a supporting body in an electrophoretic apparatus, which cell comprises a tray having an upper side for accommodating a gel layer serving as the electrophoretic supporting body, a pair of legs, each of said legs extending laterally along an opposing side of said tray, each leg having a plurality of openings communicating between the upper side of the tray and a lower open end of the leg, and partitioning members, each partitioning member being disposed between adjacent ones of said openings to laterally partition the supporting body at the opposing sides.

4,414,074
PROCESS FOR THE PURIFICATION OF 4,4'-DIISOCYANATODIPHENYLMETHANE BY PLURAL DISTILLATIONS

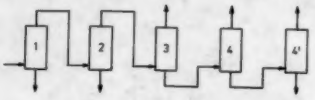
Günther Ellendt; Günter Gleitsmann, both of Krefeld, and Max Scheidel, Willich, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 25, 1982, Ser. No. 436,489

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1981, 3145010

Int. Cl.³ B01D *3/10*; **C07C** *119/00*

U.S. Cl. 203—21 **5 Claims**



1. A process for the production of 4,4'-diisocyanatodiphenylmethane by the distillative separation of diisocyanatodiphenylmethane isomers from a polyisocyanate mixture of the diphenylmethane series obtained by phosgenating aniline/formaldehyde condensates, comprising separating said isomer from said mixture in a first distillation stage, further distilling the distillate resulting from said first stage in a second distillation stage, drawing off from 0.5 to 20%, by weight, of the quantity of product introduced into said second stage from the sump of said second stage, then subsequently separating 2,2'- and 2,4'-diisocyanatodiphenylmethane from the distillate obtained as the head product of said second stage in a third distillation stage, and finally working-up the sump product remaining from said third stage in order to obtain very pure 4,4'-diisocyanatodiphenylmethane, characterized in that

(a) the temperatures of the condenser outlets of the first, second and third distillation stages are adjusted to from 130° C. to 230° C., such that the temperatures are from 10° to 50° C. below the incoming vapor temperature which is predetermined in each case by the vacuum in the distillation column, and

(b) the sump remaining from said third stage is worked up in two distillation stages, such that in a first final stage, from 50 to 90%, by weight, of the sump remaining from said third stage is isolated as the head product in the form of pure 4,4'- diisocyanatodiphenylmethane, and in a second final stage, the sump of the first final stage is split into a further quantity of pure 4,4'-diisocyanatodiphenylmethane as the head product and into a distillation residue as the sump.

4,414,075
APPARATUS FOR AND A METHOD OF SELECTIVE PLATING OF COMPONENTS INCLUDING STRIP COMPONENTS

John M. Cockeram, 3 Church Rd., Spratton, Northampton, England

Filed Dec. 23, 1981, Ser. No. 333,692

Claims priority, application United Kingdom, Dec. 23, 1980, 8041267; Sep. 17, 1981, 8128196

Int. Cl.³ C25D *5/02, 5/08, 17/00*

U.S. Cl. 204—15 **10 Claims**

1. An apparatus for use in selective plating a component, which apparatus comprises an electroplating zone, a series of movable selective plating heads in an endless chain configuration, wherein each plating head comprises an electrolyte opening, means for indexing the plating head to a component, means for engaging the component so as to expose an area to be selectively plated to electrolyte, means for releasably sealing the rear of the component in the region of the area to be plated, means for fastening the sealing means prior to the entry of the plating head into the electroplating zone and means for releasing the sealing means after the plating head leaves the electroplating zone, resilient or slidable couplings provided between the plating heads and means provided in the electroplating zone for supplying electrolyte to the area to be selectively plated.

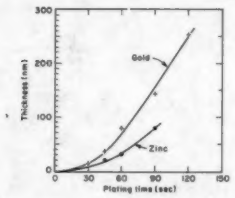
4,414,076
LOW RESISTANCE OHMIC CONTACT

Kamal Tabatabaie-Alavi, Cambridge; Abu N. M. M. Choudhury, Belmont; Nancy J. (Slater) Gabriel, Cambridge, and Clifton G. Fonstad, Arlington, all of Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 1, 1983, Ser. No. 471,098

Int. Cl.³ C25D *5/02, 5/10, 5/18*

U.S. Cl. 204—15 **8 Claims**



1. A method of fabricating low resistance ohmic contact on a p-type InP substrate using photoresist which comprises the steps of:

plating a first film of gold on said substrate;

plating a zinc film on said first layer of gold; and

plating a second film of gold on said layer of zinc.

4,414,077
METHOD FOR PRODUCTION OF COLORED ALUMINUM ARTICLE

Kohichi Yoshida, Shimizu; Teruo Miyashita; Yasuo Oka, both of Fuji, and Takashi Kajiyama, Shizuoka, all of Japan, assignors to Nippon Light Metal Company Limited, Tokyo, Japan

Filed Mar. 23, 1981, Ser. No. 246,922

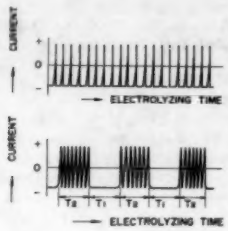
Claims priority, application Japan, Mar. 26, 1980, 55/37521

Int. Cl.³ C25D *11/22*

U.S. Cl. 204—35 N **18 Claims**

1. An improved method for the electrolytic coloring of anodized aluminum by optical interference effects, which comprises subjecting an aluminum article carrying on its surface a porous anodic oxide film including a barrier layer in sequence to (1) an electrolytic treatment for enlarging the volume of the bottom of the pores in the film, (2) a preliminary electrolytic treatment in which said article is connected as an anode to a DC current to adjust the difference in thickness of said barrier layer to obtain more uniform current distribution at all parts of said article during subsequent coloring, and (3) an electrolytic coloring treatment in which the aluminum article is connected as a cathode in an electrolytic bath containing a soluble metal salt and subjected to electrolysis with a negative DC current having superimposed positive pulses to produce a metallic electrodeposition at the enlarged bottom of said pores, wherein the frequency of the pulses is in the range of 200 to

2600 pulses per minute and the ratio (Ta/Tc) between the periods of anodic and cathodic currents, respectively, during the coloring treatment does not exceed 0.3, said coloring treatment being controlled such that the upper surface of said



deposition is spaced from said barrier layer a distance in the order of the wave length of visible light, whereby the coloration of said article is determined by optical interference effects.

4,414,078

METHOD FOR PRETREATMENT IN THE PRODUCTION OF TIN-FREE STEEL

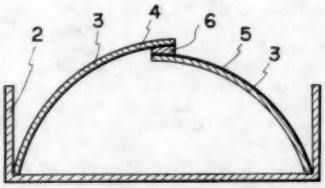
Nobuyoshi Shimizu; Kinji Saijo; Kenji Hizuka, all of Kudamatsu; Tsuneo Inui, Tokuyama, and Yoshikazu Kondo, Kudamatsu, all of Japan, assignors to Toyo Kohan Company, Limited, Tokyo, Japan

Continuation of Ser. No. 141,210, Apr. 17, 1980, abandoned. This application Mar. 12, 1982, Ser. No. 357,665

Claims priority, application Japan, Aug. 9, 1979, 54-100723

Int. Cl.³ C25D *5/36*

U.S. Cl. 204—34 **9 Claims**



1. A method for pretreating a steel substrate prior to formation of a tin-free steel which comprises pickling the steel substrate with sulfuric or hydrochloric acid to activate the surface of the steel substrate; subjecting the thus-pickled steel substrate to an anodic treatment or an anodic treatment after a cathodic treatment, said anodic treatment being conducted in an alkaline electrolyte containing a member selected from the group consisting of an alkali metal compound, an ammonium compound or mixtures thereof having a pH of above 8, and then subjecting the thus-pretreated steel substrate to an electrolytic chromic acid treatment to produce a tin-free steel by forming a lower layer of metallic chromium in the range of 50–150 mg/m^2 and an upper layer of hydrated chromium oxide in the range of 8–25 mg/m^2 as chromium.

4,414,079

PROCESS FOR THE PREPARATION OF A 4-BUTANOLIDE COMPOUND

Kazunori Yamataka; Toshiro Isoya, and Nobuya Kitaguchi, all of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jul. 15, 1982, Ser. No. 398,604

Claims priority, application Japan, Sep. 30, 1981, 56-155746

Int. Cl.³ C25B *3/00*

U.S. Cl. 204—75 **20 Claims**

1. A process for the preparation of a 4-butanolide compound which comprises subjecting a mixture of an acrylic ester and an aldehyde selected from the group consisting of aliphatic aldehydes having 1 to 13 carbon atoms, aromatic aldehydes and aralkyl aldehydes to electrolytic reduction, said mixture of the acrylic ester and the aldehyde being in the form of an aqueous emulsion comprising a water phase and an organic phase, in the presence of at least one phase-transfer catalyst selected from the group consisting of quaternary ammonium salts represented by the general formula:

$$\left[R^2-\overset{\displaystyle R^1}{\underset{\displaystyle R^3}{\overset{|}{\underset{|}{N}}}}-R^4 \right] X_n$$

wherein X stands for an acid radical, n stands for an integer corresponding to the valence of X, and R^1, R^2, R^3 and R^4 each independently stand for an alkyl group or an aralkyl group, provided that, when said aldehyde is an aliphatic aldehyde having 5 to 13 carbon atoms, an aromatic aldehyde or an aralkyl aldehyde, the total number of carbon atoms in R^1, R^2, R^3 and R^4 of the quaternary ammonium ion moiety is 12 to 30, said total number of carbon atoms is R^1, R^2, R^3 and R^4 being calculated by the equation $n \times$(carbon number in R^1 + carbon number in R^2 + carbon number in R^3 + carbon number in R^4)/n,

and quaternary phosphonium salts in an electrolytic cell provided with at least one pair of anode and cathode, said cathode being made of lead or a lead alloy.

4,414,080

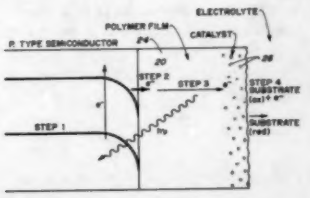
PHOTOELECTROCHEMICAL ELECTRODES

Roger M. Williams, and Alan Rembaum, both of Pasadena, Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 10, 1982, Ser. No. 376,306

Int. Cl.³ C25B *1/02*; H01M *6/36*

U.S. Cl. 204—129 **23 Claims**



23. A method of photolysing water comprising placing an electrode comprising a solid semiconductor having a band gap below 2.0 eV coated with a film of polyquaternary, bipyridyl polymer containing cross-links between unsaturated groups on different chains and a dispersion of fine, hydrogen producing catalyst, and a counterelectrode in aqueous electrolyte;

illuminating the coated electrode with solar energy;

photolysing water to produce hydrogen gas; and

collecting said gas.

4,414,081

FAMILY OF COMPOUNDS CROSSLINKABLE BY PHOTON IRRADIATION

Armand Eranian; Jean-Claude Dubois; Maryse Gazard, and Francoise Barre, all of Paris, France, assignors to Thomson - CSF, Paris, France

Continuation of Ser. No. 163,479, Jun. 27, 1980, abandoned, which is a division of Ser. No. 67,905, Aug. 20, 1979, Pat. No. 4,285,788, which is a division of Ser. No. 882,169, Feb. 28, 1978, Pat. No. 4,259,162. This application Nov. 6, 1981, Ser. No. 318,940

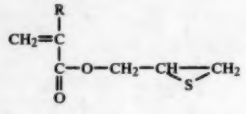
Claims priority, application France, Mar. 4, 1977, 77 06441

Int. Cl.³ C08F *2/50*

U.S. Cl. 204—159.18 **10 Claims**

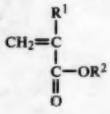
1. A copolymer composition crosslinkable by ionizing radiation into a 3-dimensional network, said composition comprising, as the cross-linkable monomers:

(i) from 40 to 80% by weight of 2,3 epithiopropyl alkyl acrylate monomer units of the formula:



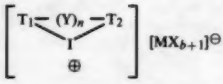
wherein R is hydrogen or a C_1 to C_4 alkyl; and

(ii) from 60 to 20% by weight of vinyl monomer units of the formula:



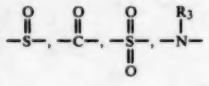
wherein R^1 is hydrogen or an alkyl group of the formula C_nH_{2n+1}, where n is an integer from 1 to 10 and R^2 is a C_1 to C_5 alkyl group, together with

(iii) an initiating amount of an aryl iodonium salt of the formula:



where n is 0 or 1,

T_1 and T_2, which are the same or different, are aromatic groups consisting from 4 to 20 carbon atoms, Y is:



where R_3 is hydrogen, alkyl or acyl, or

where R_4 and R_5, which may be the same or different, are hydrogen, a C_1 to C_4 alkyl or a C_{2-C4} alkenyl,

M is Fe, Sn, Sb, Bi, B, P or As,

X is a halogen atom, and B is an integer from 1 to 5.

4,414,082

PROCESS FOR CRACKING HYDROCARBONS

Michael P. Neary, 409 E. Coronado #2, Sante Fe, N. Mex. 87501, and Thomas A. Wilson, 14 Bayview Ct., Manhasset, N.Y. 11030

Continuation-in-part of Ser. No. 962,770, Nov. 21, 1978, abandoned, which is a division of Ser. No. 213,039, Dec. 4, 1980, Pat. No. 4,335,160. This application Nov. 16, 1981, Ser. No. 321,396

Int. Cl.³ C07C *3/24*

U.S. Cl. 204—162 R **1 Claim**

1. The process for cracking hydrocarbons which comprises forming a metastable reagent gas, intermingling the same with hydrocarbon vapor, to cause the rupture of carbon-to-carbon bonds in the molecules of said hydrocarbon vapor to produce an improved hydrocarbon mixture.

4,414,083

REMOVAL OF DIENE IMPURITIES FROM ALKENES OR ALKANES OVER ACTIVATED MAGNESIUM OXIDE UNDER ULTRAVIOLET RADIATION

Filippo Pennella, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 27, 1982, Ser. No. 343,047

Int. Cl.³ C07C *3/24*

U.S. Cl. 204—162 R **9 Claims**

1. A process for reducing the amount of diene impurities in a gaseous stream of hydrocarbons comprising alkanes and/or alkenes having up to five carbon atoms and at least one diene impurity, which process comprises contacting said stream with an activated magnesium oxide catalyst at a temperature in the approximate range of about 20° C. to about 300° C., and under ultraviolet light radiation.

4,414,084

PROCESS FOR CONVERSION OF CELLULOSE TO AMINO ACIDS BY RADIOFREQUENCY PLASMA OF NITROGEN AND HYDROGEN

Truman L. Ward, and Ruth R. Benerito, both of New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 18, 1982, Ser. No. 409,268

Int. Cl.³ C07G *13/00*

U.S. Cl. 204—165 **7 Claims**

1. A process for producing a mixtur ⁄ of amino acids from cellulose which process comprises:

(a) positioning cellulose between or near electrodes in a radiofrequency plasma reaction chamber;

(b) sealing and then reducing the pressure in said chamber;

(c) bleeding a mixture containing a sufficient ratio of hydrogen and nitrogen through the chamber while maintaining the reduced pressure so that the hydrogen and nitrogen can react with the cellulose to form amino acids;

(d) applying a radiofrequency electric current to the electrodes with sufficient power to create a colored plasma in the reaction chamber for a sufficient period of time to consume the cellulose thereby producing a mixture of amino acids from the cellulose.

4,414,085

METHOD OF DEPOSITING A HIGH-EMISSIVITY LAYER

Charles E. Wickersham, Columbus, and Ellis L. Foster, Powell, both of Ohio, assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Oct. 8, 1981, Ser. No. 309,656

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—192 C **8 Claims**

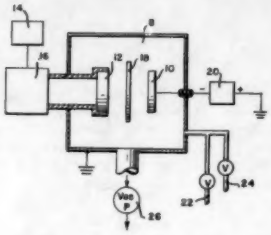
1. A method for depositing a carbon layer on a substrate comprising:

providing a chamber for RF reactive sputter deposition,

providing within the chamber a substrate and a target comprised of a carbide compound,

providing a noble gas and a hydrocarbon gas to the chamber,

applying RF power to the target to sputter deposit the carbide compound onto the substrate and to decompose the hydrocarbon gas to hydrogen and carbon such that carbon deposits on the target and substrate whereby a layer



having a carbide/carbon composition gradient develops on the substrate, and

maintaining the partial pressure of hydrocarbon gas sufficiently high so that the carbon accumulation rate on the target is greater than the sputter removal rate, whereby a continuous layer of carbon will form on the target and a layer of carbon will form over the carbide/carbon gradient on the substrate.

4,414,086

MAGNETIC TARGETS FOR USE IN SPUTTER COATING APPARATUS

Lawrence T. Lamont, Jr., Mountain View, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Nov. 5, 1982, Ser. No. 439,681

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—192 M **12 Claims**

1. A magnetic sputter target for use in a magnetron sputter coating source having a magnetic field means for establishing magnetic fields above a sputter surface of a sputter target, said magnetic sputter target comprising a first magnetic member; and a second magnetic member spaced from said first magnetic member to form a gap containing no magnetic material between said magnetic members, whereby said magnetic members will cooperate with the magnetic field means in a magnetron sputter source to form a fringing magnetic field across said gap.

4,414,087

MAGNETICALLY-ASSISTED SPUTTERING METHOD FOR PRODUCING VERTICAL RECORDING MEDIA

Benjamin B. Meckel, Del Mar, Calif.

Filed Jan. 31, 1983, Ser. No. 462,564

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—192 M **5 Claims**

1. A magnetically-assisted sputtering method for producing vertical recording media by sputtering a magnetic target onto a substrate to form a magnetic film exhibiting a high degree of uniaxial magnetic anisotropy along an axis substantially normal to the surface of said substrate, comprising the steps of heating a magnetic target to a temperature not less than about its Curie temperature to render said target non-magnetic while selectively cooling the portions of said target through which magnetic flux penetrates to a temperature below the Curie temperature of the target whereby to retain said portions in a magnetic state while sputtering said target, said target being formed from a cobalt-containing alloy having a Curie temperature of not greater than about 900° C., and sputtering said target while in a non-magnetic state to form said magnetic film.

4,414,088

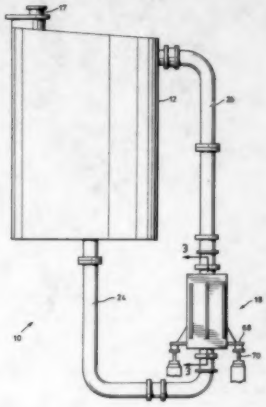
CHLORATE CELL SYSTEM

Joseph B. Ford, Oakville, Canada, assignor to ERCO Industries Limited, Islington, Canada

Filed Sep. 21, 1981, Ser. No. 304,108

Int. Cl.³ C25B *15/08, 9/00, 11/10, 1/24*

U.S. Cl. 204—237 **4 Claims**



1. An electrolysis unit for the production of sodium chlorate by electrolysis of sodium chloride solution, which comprises:

a single reaction tank having a liquid feed inlet for receiving sodium chloride solution in said tank and a liquid product outlet for removing sodium chlorate product solution from said tank,

a plurality of electrolysis cells connected in electrical series one with another in a bank wherein the cells are physically joined together in substantially fixed position relative to one another,

each of said plurality of cells having a plurality of anode and cathode electrodes located therein and extending from respective spaced apart parallel anode and cathode backing plates in interleaved manner to define upwardly-directed parallel electrolysis channels therebetween extending between a lower inlet and an upper outlet,

said cathode electrodes and cathode backing plates being constructed of mild steel, said anode electrodes being constructed of titanium having an electroconductive surface and said anode backing plate being constructed of titanium,

said bank of cells having an anode backing plate located at one end and a cathode backing plate located at the other end, said bank of cells further having a cell divider plate located between each adjacent pair of cells in said bank to isolate the cells one from another, said cell divider plate consisting of the cathode backing plate of one cell and the anode backing plate of another cell intimately and integrally explosively bonded to opposite sides of a copper plate, said anode backing plate, cathode backing plate and copper plate being coextensive with each other,

said cell divider plate being rigidly connected to but electrically insulated from structural parts of adjacent cells in said bank,

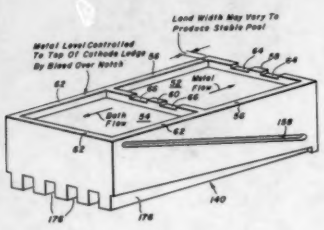
a plurality of first liquid feed conduits corresponding in number with the number of said plurality of cells in said bank extending between respective liquid outlets of said reaction tank and respective ones of said liquid inlets to said cells, and

a plurality of second liquid feed conduits corresponding in number with the number of said plurality of cells in said bank extending between respective liquid outlets of said cells and respective liquid inlets to said reaction tank.

4,414,089
ELECTROLYSIS CELL FOR REDUCTION OF MOLTEN METAL HALIDE

Matthew J. McMonigle, New Kensington, and Alfred F. LaCamera, Level Green, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jul. 30, 1982, Ser. No. 404,347
Int. Cl.³ C25C 3/08
U.S. Cl. 204—244 **11 Claims**


Load Width May Vary To Produce Stable Pool
Metal Level Controlled To Top Of Cathode Ledge By Bleed Over Notch
Metal Flow
Bath Flow

1. A cell for producing metal by electrolytic reduction of a metal halide in a molten salt bath comprising the metal halide dissolved in at least one molten salt of higher electrode-composition potential than the metal halide, said cell comprising:

(a) a plurality of electrodes, disposed horizontally and arranged in at least one vertical stack;

(b) each stack including a cathode, at least one intermediate bipolar electrode and an anode;

(c) the electrodes in each stack being adapted to be located beneath the upper level of the bath and arranged in a superimposed, spaced relationship defining inter-electrode spaces between each pair of adjacent electrodes;

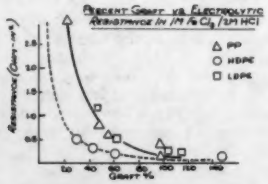
(d) the upper face of each cathode and of each of the bipolar electrodes having at least one reservoir, bounded by a perimetric wall, for collecting metal producing during operation of the cell; and

(e) level maintaining means within said reservoir to maintain a pool of metal at a predetermined level adjacent the top of said perimetric wall whereby the cathode face of each electrode is protected by a layer of metal and the flow of excess metal from said reservoir is directable toward predetermined paths of metal flow within said cell and away from gas flow paths, said level maintaining means comprising one or more notches cut into the perimetric wall to such a depth that a pool of metal in the reservoir will be maintained at a level adjacent the top of the perimetric wall and metal produced in excess of that amount will drain through said one or more notches.

4,414,090
SEPARATOR MEMBRANES FOR REDOX-TYPE ELECTROCHEMICAL CELLS

Vincent F. D'Agostino, Huntington, and Joseph Y. Lee, Lake Grove, both of N.Y., assignors to RAI Research Corporation, Hauppauge, N.Y.

Filed Oct. 1, 1981, Ser. No. 307,588
Int. Cl.³ C25B 9/00, 13/08; H01M 14/00, 2/16
U.S. Cl. 204—252 **11 Claims**

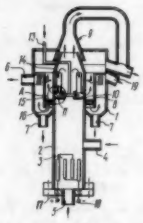


1. In an improved redox electrochemical cell incorporating two chemically-inert electrodes of opposite polarity, at least one aqueous acidic electrolyte, and a separator membrane between the adjacent electrodes, the improvement comprising a separator membrane formed from a polyolefin film grafted with a vinyl-substituted monomer via gamma irradiation.

4,414,091
APPARATUS FOR ELECTROCHEMICAL PURIFICATION OF CONTAMINATED LIQUIDS

Alexandr A. Axenko, ulitsa Bairona, 152, kv. 25; Miron M. Nazarian, ulitsa Bljukhera, 13, kv. 138; Vladimir A. Kolyada, ulitsa Petrozavodskaya, 91a, kv. 30; Arkady R. Mataev, ulitsa Timurovtsev, 19, kv. 130, and Ljudmila F. Shamsha, ulitsa Dinamovskaya, 3, kv. 23, all of, Kharkov, U.S.S.R.

Continuation of Ser. No. 221,245, Dec. 30, 1980, abandoned.
This application Apr. 7, 1982, Ser. No. 366,444
Int. Cl.³ C25B 9/00; C02F 1/46
U.S. Cl. 204—277 **6 Claims**



1. An apparatus for electrochemical purification of contaminated liquids comprising:

a settling chamber having an outlet pipe for purified liquid and an outlet pipe for discharge of sludge;

an electrocoagulation chamber communicating with said settling chamber at a level below the purified liquid outlet thereof, said electrocoagulation chamber having a system of soluble electrodes mounted therein, an inlet pipe for contaminated liquids disposed above said electrodes and an inlet pipe for electrolyte disposed below said inlet for contaminated liquids;

and compressed air jet pump means for drawing froth from the upper portion of said electrocoagulation chamber into said settling chamber.

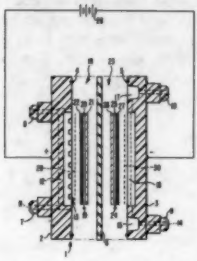
4,414,092
SANDWICH-TYPE ELECTRODE

Wen-Tong P. Lu, Upper St. Clair, and Earl R. Garcia, Ingram, both of Pa., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Apr. 15, 1982, Ser. No. 368,556
Int. Cl.³ C25B 9/00, 11/12
U.S. Cl. 204—294 **11 Claims**

1. In a method of making an electrode wherein a suspension in a liquid is prepared of a powdered catalyst containing a noble metal, carbon powder, and a binder, the suspension is poured over a carbon substrate, dryed, compressed, and sin-

tered to form a solid catalyst layer bonded to said carbon substrate, the improvement comprising placing carbon paper



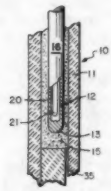
on the surface of said solid catalyst layer prior to said compressing.

4,414,093

MULTIFUNCTIONAL REFERENCE ELECTRODE

Laszlo Redey, Lisle, and Donald R. Vissers, Naperville, both of Ill., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Dec. 30, 1981, Ser. No. 335,997
Int. Cl.³ G01N 27/30
U.S. Cl. 204—412 15 Claims



1. A multifunctional reference electrode, comprising a metal tube closed at one end, a means inside said metal tube near said closed end for measuring the temperature thereof, a housing surrounding said metal tube, an electrode terminal electrically connected to said metal tube extending outside of said housing, an electrolyte between said housing and the outer surface of said metal tube, and an ion diffusion barrier plug associated with said housing in contact with said electrolyte, whereby said multifunctional reference electrode provides a temperature dependent electrode potential at the surface of said metal tube where an electrochemical double layer exists between the metal tube outer surface and said electrolyte in combination with means for measuring the temperature of said metal tube.

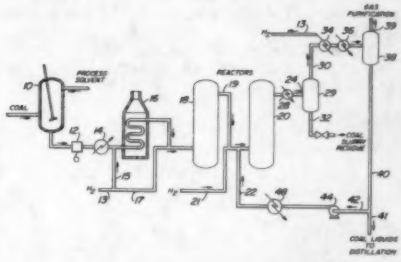
8. A combination electrochemical cell and reference electrode comprising a plurality of working electrodes and a reference electrode and a first electrolyte in communication with said working and said reference electrodes, said reference electrode including a metal tube closed at one end said metal tube acting as internal contact for said reference electrode, means inside said metal tube electrically insulated therefrom for measuring the temperature thereof near said closed end, a housing surrounding said metal tube, a second electrolyte having a fixed anion activity between said housing and the outer surface of said metal tube providing a temperature dependent electrode potential at the surface of said metal tube when an electrochemical double layer exists between the metal tube outer surface and said second electrolyte, an ion diffusion barrier associated with said housing providing communication between ions of said first and second electrolytes, and means for measuring the temperature of said reference electrode and a working electrode adjacent thereto and the potential difference between said reference electrode and said working electrodes, whereby the fixed anion activity and measured temperature of said reference electrode and the potential difference between said reference electrode and said working electrodes provides a value for the electrode potential at the working electrodes.

4,414,094

SOLVENT REFINED COAL REACTOR QUENCH SYSTEM

Robert M. Thorogood, Macungie, Pa., assignor to International Coal Refining Company, Allentown, Pa.

Filed Mar. 14, 1983, Ser. No. 474,926
Int. Cl.³ C10G 1/04
U.S. Cl. 208—8 LE 6 Claims



1. In a process for the solvent refining of coal wherein a slurry of finely ground coal in process solvent is passed through a preheater to a coal liquefaction stage in the presence of hydrogen rich gases at elevated temperatures and pressures, the improvement wherein said coal liquefaction stage comprises at least two reactors in series and operated at approximately the same temperature, the second and subsequent reactors being cooled by using a process-derived condensed product which is recycled thereto and provides cooling by evaporation.

4,414,095

MESOPHASE PITCH USING STEAM CRACKER TAR (CF-6)

Ghazi Dickakian, Scotch Plains, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jun. 12, 1981, Ser. No. 273,200
Int. Cl.³ C10C 1/20, 3/00; D01F 9/12; C01F 9/00
U.S. Cl. 208—44 10 Claims

1. A process for preparing a pitch suitable for carbon fiber manufacture comprising:

providing a steam cracker tar or a vacuum stripped steam cracker tar;

adding a polycondensed aromatic pitch oil boiling in an approximate range of 400° C. to 600° C. to said steam cracker tar or vacuum stripped steam cracker tar to provide a mixture; and

heat soaking said mixture at temperatures in the range of from about 350° C. to about 430° C. whereby a pitch suitable for carbon artifact manufacture is obtained.

4,414,096

CARBON PRECURSOR BY HYDROHEAT-SOAKING OF STEAM CRACKER TAR

Ghazi Dickakian, Scotch Plains, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jun. 18, 1981, Ser. No. 275,040

The portion of the term of this patent subsequent to Jun. 2, 1998, has been disclaimed.

Int. Cl.³ C10C *1/00, 3/00, 3/02*

U.S. Cl. 208—44 **10 Claims**

1. A process for preparing a pitch suitable for carbon artifact manufacture comprising:

heat soaking a steam cracker tar or a component of a steam cracker tar in a hydrogen atmosphere for a time sufficient to provide a pitch suitable for carbon artifact manufacture.

4,414,097

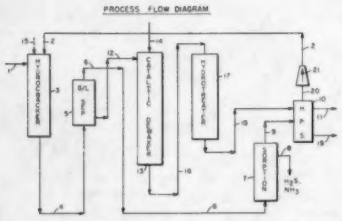
CATALYTIC PROCESS FOR MANUFACTURE OF LOW POUR LUBRICATING OILS

Arthur W. Chester, Cherry Hill, and William E. Garwood, Haddonfield, both of N.J., assignors to Mobil Oil Corporation, N.Y.

Filed Apr. 19, 1982, Ser. No. 369,852

Int. Cl.³ C10G *49/08, 47/16*

U.S. Cl. 208—59 **12 Claims**



6. A process for producing a dewaxed lubricating oil base stock from a hydrocarbon feedstock boiling above about 343° C. which comprises hydrocracking said feedstock in the presence of a hydrocracking catalyst at hydrocracking conditions including a temperature of from about 260° C. to about 482° C., a pressure of from about 1000 psig to about 3000 psig and a LHSV of from about 0.1 to about 5 to produce a hydrocrackate, dewaxing said hydrocrackate in the presence of hydrogen and a dewaxing catalyst comprising crystalline zeolite ZSM-23 at dewaxing conditions including a temperature of from about 260° C. to about 482° C., a pressure of from about 200 psig to about 3000 psig and a LHSV of from about 0.2 to about 20 to produce a dewaxed hydrocrackate, and hydrotreating said dewaxed hydrocrackate in the presence of a hydrotreating catalyst at hydrotreating conditions including a temperature of from about 176° C. to about 371° C., a pressure of from about 1000 psig to about 3000 psig and a LHSV of from about 0.1 to about 10.

4,414,098

UPGRADING CARBO-METALLIC OILS WITH USED CATALYST

Oliver J. Zandona, Ashland, and William P. Hettinger, Jr., Russell, both of Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

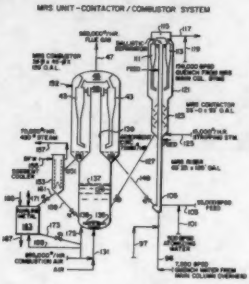
Filed Jul. 30, 1981, Ser. No. 288,572

Int. Cl.³ C10G *11/18*

U.S. Cl. 208—120 **33 Claims**

1. A process for upgrading residual oil portions of crude oils comprising metal contaminants and Conradson carbon producing components to provide an upgraded residual oil product reduced in metal contaminants and Conradson carbon producing components which comprises,

(a) contacting at an elevated temperature said residual portions of crude oil with solid sorbent particle material of relatively high pore volume and surface area sufficient to immobilize deposited vanadium compounds by adsorption thereof within the pore structure of said sorbent particle during said contacting,



(b) said sorbent particle being selected from one of deactivated, spent or equilibrium cracking catalyst which has been treated with one or a combination of alkali metal compounds in an amount sufficient to neutralize available acid cracking sites therein and yield a deactivated cracking catalyst sorbent material with essentially no significant cracking activity of high pore volume and surface area, and

(c) using said deactivated cracking catalyst sorbent material of step (b) in step (a) above.

4,414,099

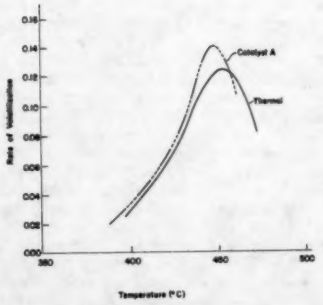
FLUID COKING WITH THE ADDITION OF ALKALINE EARTH METAL FERRITE-CONTAINING CATALYSTS

Robert C. Schucker, Baton Rouge, La., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Sep. 13, 1982, Ser. No. 416,908

Int. Cl.³ C10G *11/18, 51/04*

U.S. Cl. 208—121 **12 Claims**

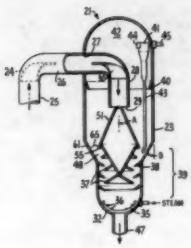


1. In a fluid coking process comprising the steps of: contacting a carbonaceous chargestock with hot fluidized solids in a fluidized coking bed contained in a coking zone maintained in a fluidized state by the introduction of a fluidizing gas and operated at coking conditions, to produce a vapor phase product and a solid carbonaceous material which deposits on said fluidized solids, the improvement which comprises the presence of a catalyst in said coking zone, said catalyst comprising an effective amount of at least one alkaline earth metal ferrite.

4,414,100
FLUIDIZED CATALYTIC CRACKING

Russell R. Krug, San Rafael, and Robert P. Hohmann, Oakland, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Dec. 29, 1981, Ser. No. 335,458
Int. Cl.³ C10G 11/18
U.S. Cl. 208—153 22 Claims



1. A fluidized catalytic reaction apparatus comprising:

(a) means for conveying an input feed of a catalytic reaction mixture of hydrocarbonaceous material and catalyst particles upwardly in a riser conduit arranged externally to a reactor vessel generally vertically co-extensive with the upper portion of the riser conduit;

(b) said riser conduit having a horizontal portion traversing an upper wall of said vessel and a discharge outlet on a downflow portion of said conduit disposed in substantially the center of said vessel for downward discharge of said reaction mixture;

(c) means for deflecting the downwardly moving catalytic reaction mixture at an angle with respect to said discharge outlet of said riser conduit, said deflecting means being adjacent to and below said discharge outlet for directing said mixture toward an inner wall of said vessel to initiate disengagement of catalyst from the reaction products;

(d) means for directing disengaged catalyst to a stripping zone arranged in a lower portion of said vessel; and

(e) means for recovering reaction products separated from catalyst in an upper portion of said vessel.

18. A process for separating hydrocarbon reaction products from catalyst in a fluidized catalytic reaction system comprising the steps of:

(a) conveying an input feed of a fluidized catalytic reaction mixture upwardly within a riser reaction conduit zone arranged generally parallel and external to a separation vessel;

(b) deflecting the catalytic reaction mixture first horizontally and then downwardly and constraining the resulting mixture of hydrocarbon vapor and catalyst to discharge downwardly into an outlet zone in the central portion of said vessel above the upper level of the dense phase of catalyst;

(c) deflecting said downwardly moving mixture above said dense phase outwardly from said outlet zone toward the wall of said vessel to promote early disengagement of catalyst from hydrocarbon vapor;

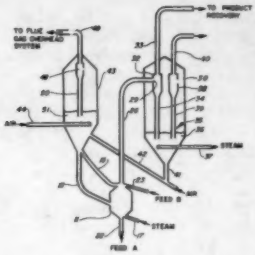
(d) directing disengaged catalyst to a stripping zone arranged in a lower portion of said vessel; and

(e) recovering hydrocarbon vapors separated from catalyst in an upper portion of said vessel.

4,414,101
HYDROCARBON CONVERSION METHOD AND APPARATUS

Jeffrey S. Smith, League, Tex.; George P. Quinn, Clarendon Hills, and Iacovos A. Vasalos, Downers Grove, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Aug. 17, 1981, Ser. No. 293,693
Int. Cl.³ G10G 35/00
U.S. Cl. 208—153 9 Claims



1. In a process for the cyclic, continuous catalytic conversion of a hydrocarbon feedstock wherein the feedstock is subjected to conversion in contact with fluidized hydrocarbon conversion catalyst particles in a reaction zone comprising a transfer line reactor, catalyst particles which are deactivated by deposits formed thereon during hydrocarbon conversion in the reaction zone are separated from the reaction zone effluent and passed to a stripping zone wherein volatile deposits formed thereon during the hydrocarbon conversion in the reaction zone are removed from the catalyst particles by contact with a stripping gas, stripped catalyst particles are separated from the stripping zone effluent and passed to a catalyst regeneration zone wherein non-volatile deposits formed thereon during the hydrocarbon conversion in the reaction zone are removed from the catalyst particles to thereby regenerate the catalyst particles and the regenerated catalyst particles are separated from the regeneration zone effluent gas and recirculated to the reaction zone; the improvement comprising:

providing a reaction vessel in the reaction zone and upstream of the transfer line reactor, and a plurality of feed inlets in the reaction zone to permit delivery of the hydrocarbon feed at one of a plurality of points spaced substantially upstream or downstream of one another in the reaction zone, at least one such point being in the reaction vessel;

passing catalyst particles from the regeneration zone and into the reaction vessel, introducing a fluidizing gas into the reaction vessel and maintaining a dense fluidized bed of the catalyst particles in the reaction vessel so as to substantially completely fill the reaction vessel with the dense fluidized bed and so that the fluidized bed has a density within the range of from 12 to about 50 pounds per cubic foot;

introducing the hydrocarbon feedstock into the reaction zone through a one of the plurality of feed inlets to thereby control the contact time of the hydrocarbon feedstock with the catalyst particles in the reaction zone and regulate the severity of the hydrocarbon conversion in the reaction zone;

passing the entire effluent from the reaction vessel into the transfer line reactor; and

separating the catalyst particles from the effluent from the transfer line reactor and passing the separated catalyst particles to the stripping zone.

4,414,102
PROCESS FOR REDUCING NITROGEN AND/OR OXYGEN HETEROATOM CONTENT OF A MINERAL OIL

Lillian A. Rankel, Plainsboro, and Leslie R. Rudnick, Trenton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 15, 1981, Ser. No. 263,820
Int. Cl.³ C10G *45/00, 45/04, 45/60, 45/08*
U.S. Cl. 208—211 **18 Claims**

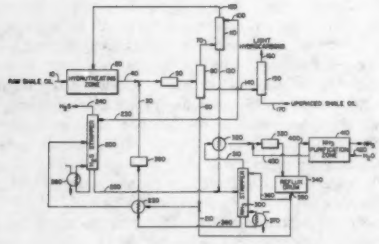
1. A process for the transformation of nitrogen-containing or oxygen-containing components of a mineral oil to sulfur-containing components which comprises:

contacting a mineral oil comprising nitrogen-containing or oxygen-containing components with a gaseous mixture containing hydrogen and hydrogen sulfide which comprises between 10 and 90 mole percent hydrogen sulfide, and a fresh multimetal catalyst under process conditions effective to transform nitrogen-containing or oxygen-containing components to sulfur-containing components of said mineral oil, including a temperature of about 700° to about 875° F., said multimetal being a Group VB metal, a Group VIB metal, and a Group VIII metal or mixtures thereof.

4,414,103
SELECTIVE REMOVAL AND RECOVERY OF AMMONIA AND HYDROGEN SULFIDE

Thomas R. Farrell, Hercules, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 9, 1982, Ser. No. 366,892
Int. Cl.³ C10G *45/02, 31/08*; B01D *3/00*
U.S. Cl. 208—212 **1 Claim**



1. A method of treating a hydrocarbon material containing at least 3 parts by weight nitrogen per 1 part sulfur comprising:

(a) hydrotreating said hydrocarbon material in the presence of hydrogen, wherein most of the nitrogen remaining in the hydrocarbon material is converted to ammonia, and wherein most of the sulfur remaining in the hydrocarbon material is converted to hydrogen sulfide;

(b) washing said hydrotreated hydrocarbon material with only enough water to absorb the bulk of the hydrogen sulfide but only a fraction of the ammonia; thereby forming a washed hydrotreated hydrocarbon material containing ammonia and hydrogen sulfide in a vapor phase, and a first sour water stream comprising water, ammonia and hydrogen sulfide;

(c) separating said washed hydrotreated hydrocarbon material from the first sour water stream, and separating a vapor phase from said washed hydrotreated hydrocarbon material in a high pressure separator;

(d) scrubbing said vapor phase with water to produce a second sour water stream containing ammonia with an ammonia to hydrogen sulfide ratio of at least 6:1;

(e) stripping said first sour water stream in a hydrogen sulfide stripper;

(f) withdrawing overhead vapor from said hydrogen sulfide stripper, said vapor comprising hydrogen sulfide essentially free of ammonia;

(g) withdrawing bottoms liquid from said hydrogen sulfide stripper, said liquid comprising water, hydrogen sulfide and ammonia;

(h) adding said bottoms liquid to said second sour water stream;

(i) stripping said second sour water stream in an ammonia stripper;

(j) withdrawing overhead vapor from said ammonia stripper, said vapor comprising water, hydrogen sulfide, and ammonia;

(k) withdrawing bottoms liquid from said ammonia stripper, said liquid comprising stripped water;

(l) partially condensing said overhead vapor from said ammonia stripper to form an uncondensed portion comprising ammonia vapors substantially free of hydrogen sulfide and water, and a condensed portion comprising water, hydrogen sulfide and ammonia;

(m) returning a part of said condensed portion to said ammonia stripper; and

(n) recycling another part of said condensed portion to said hydrogen sulfide stripper.

4,414,104
PROCESS FOR REMOVAL OF METALS FROM HYDROCARBON OILS

Dennis D. Delaney, Placentia, and Donald M. Fenton, Anaheim, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

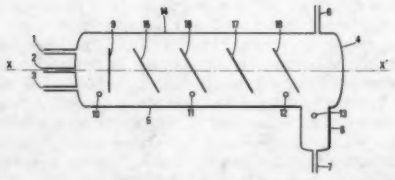
Filed May 4, 1982, Ser. No. 374,717
Int. Cl.³ C10G *17/09*
U.S. Cl. 208—251 R **14 Claims**

1. A process for removing metals from a hydrocarbon oil comprising contacting a metals-containing hydrocarbon oil with a thiocyanate compound under reaction conditions including a temperature of about 250° C. to about 500° C. producing a metals-containing solid and a product hydrocarbon of reduced metals content in comparison to said oil, and separating said metals-containing solid from said product hydrocarbon.

4,414,105
PROCESS FOR DEASPHALTING AN ASPHALTENE CONTAINING HYDROCARBON CHARGE

Alain Billon, Orlienas; Pierre Renard, St Nom la Breteche; Jean-Claude Simandoux, La Graviere, and Gerard Heinrich, Saint Germain en Laye, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Sep. 1, 1981, Ser. No. 298,431
Claims priority, application France, Sep. 1, 1980, 80 18900
Int. Cl.³ C10C *3/00*
U.S. Cl. 208—309 **8 Claims**



1. A process for deasphalting an asphaltene containing hydrocarbon charge, characterized by the steps of:

(a) Introducing a mixture of the hydrocarbon charge with at least a first fraction of light paraffinic hydrocarbon solvent at a first end portion of a substantially horizontal elongated

zone whose base slopes downwardly in the elongated direction from the first end portion to a second end portion opposite the first end portion at an angle from 2° to 15° to a horizontal line,

(b) Flowing said mixture from the first end portion to the second end portion of the elongated zone,

(c) Introducing into said elongated zone at least one second fraction of light paraffinic hydrocarbon solvent at a temperature at least 20° C. lower than the temperature of introduction of said mixture, said introduction being effected at one or more points located in the lower half of the elongated zone, in a downward direction forming an average angle of 10° to 80° with the central axis in the elongated direction of said elongated zone, oriented in the direction of flow of the mixture, and

(d) separately withdrawing an upper phase of deasphalted oil and a lower asphalt phase and separating the light hydrocarbon from each of these phases.

4,414,106

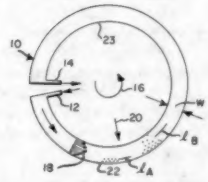
METHOD AND APPARATUS FOR IMPROVING SEDIMENTATION FIELD FLOW FRACTIONATION CHANNELS

William A. Romanauskas, Southbury, Conn., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Continuation of Ser. No. 249,964, Apr. 1, 1981, abandoned. This application Feb. 25, 1982, Ser. No. 352,077

Int. Cl.³ B03B *5/00*

U.S. Cl. 209—155 **2 Claims**



1. In an apparatus for separating particulates suspended in a fluid medium according to their effective masses, said apparatus having an annular cylindrical channel with a cylinder axis and radially inner and outer walls, said channel being comprised of an outer support ring forming said outer wall and an inner ring having an outer groove forming said inner wall, said inner ring forming a mating interface with said outer ring to define said channel there between, means for rotating said channel about said axis, means for passing said fluid medium circumferentially through said channel, and means for introducing said particulates into said medium for passage through said channel, the improvement of means to reduce leakage of said fluid medium at the mating interface between said rings by positioning a liquid layer having a density greater than the density of said fluid medium on said outer wall.

4,414,107

FLOTATION REAGENT

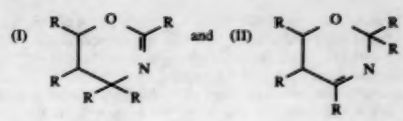
Robert M. Parlman; Clarence R. Bresson and Richard C. Doss, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 29, 1982, Ser. No. 393,239

Int. Cl.³ B03D *1/14*

U.S. Cl. 209—166 **5 Claims**

1. In an ore froth flotation wherein molybdenum values are recovered from an ore comprising the same in the froth, the improvement which comprises employing an effective amount of at least one oxazine compound, represented by the general formulas:



where R is selected from the group consisting of H, CH_3, or CH_3CH_2, as a collection agent for molybdenum sulfide.

4,414,108

APPARATUS AND METHOD FOR CONTINUOUS COUNTERCURRENT EXTRACTION AND PARTICLE SEPARATION

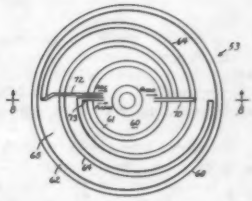
Yoichiro Ito, Bethesda, Md., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Division of Ser. No. 148,491, May 9, 1980, Pat. No. 4,324,661. This application Oct. 26, 1981, Ser. No. 315,271

The portion of the term of this patent subsequent to Apr. 13, 1999, has been disclaimed.

Int. Cl.³ B01D *15/08*

U.S. Cl. 210—198.2 **15 Claims**



1. A flow-through countercurrent chromatographic coil planet centrifuge system comprising means defining an axially rotatable coiled column having a head end and a tail end, means to rotate said column around its own axis and simultaneously and in the same angular direction and at the same angular velocity revolve the rotating column around an axis parallel to and spaced from its own axis, first phase feed conduit means connected to said column at a coil element adjacent to said head end, second phase feed conduit means connected to said column at a coil element adjacent to said tail end, second phase collection conduit means connected to said column at a coil element adjacent to said head end, first phase collection conduit means connected to said column at a coil element adjacent to said tail end, and sample-admission conduit means connected to said column at a coil element located at an intermediate portion of said column, for separating the phases in accordance with their densities and for separating components of a sample admitted through said sample-admission conduit means in accordance with the partition coefficients of said components.

4,414,109

MULTI-PORTED VALVE WITH SEALING NETWORK BETWEEN VALVE BODY AND ROTOR

William B. Aurthur, Cucamonga, Calif., assignor to Purex Corporation, Lakewood, Calif.

Continuation of Ser. No. 191,704, Sep. 29, 1980, Pat. No. 4,328,833. This application Mar. 5, 1982, Ser. No. 355,118

Int. Cl.³ B01D *29/38*

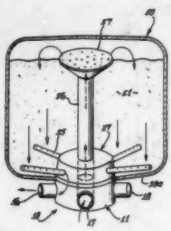
U.S. Cl. 210—278 **1 Claim**

1. In a valve having a body containing three ports, and a rotor rotatable in the body, the rotor rotatable about an axis to bring two passages in the rotor selectively into and out of

registration with the body ports, the body ports opening at a cylindrical bore in the body, and the rotor passages communicating with said bore, the rotor passages spaced about said axis, the combination with said valve of:

(a) axially spaced seal rings extending about said axis between the rotor and the body, the rings spaced at axially opposite sides of the passages and ports,

(b) multiple seal strands extending between said rings and integral therewith, two strands spaced apart about said axis at angularly opposite sides of one of said rotor passages, and two strands spaced apart about said axis at angularly opposite sides of the second of said rotor passages,



(c) said seal rings and seal strands being carried by the rotor which contains grooving corresponding in location with and receiving lengths of said seal rings and strands,

(d) the roter having wall structure and certain of said strands having attachment to the rotor via apertures in said wall structure,

(e) and including a pool filter vessel attached to the valve, one passage in the rotor communicating with a first side of media in the vessel while the other passage in the rotor communicates with a second side of the media in one position of the valve rotor, and said one passage in the rotor communicating with said second side of the media while said other passage in the rotor communicates with said first side of the media in another position of the valve rotor.

4,414,110

SEALING FOR A HOLLOW FIBER SEPARATORY DEVICE

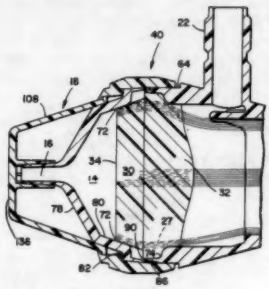
Zane H. Geel, Concord; Roger B. Hornby; Bennie J. Lipps, both of Walnut Creek; Charles E. Savage, and Pierre Vanat, both of Clayton, all of Calif., assignors to Cordis Dow Corp., Miami, Fla.

Continuation of Ser. No. 39,087, May 14, 1979, abandoned. This application Jan. 12, 1981, Ser. No. 223,964

Int. Cl.³ B01D *31/00*

U.S. Cl. 210—321.3 **13 Claims**

1. A separatory device for treating blood comprising a hollow shell elongated axially, said shell having a curvilinear central portion and openings in its opposite outer end portions, each end portion having a larger curvilinear cross section than said central portion, said shell having inlet and outlet ports located adjacent said end portions, a bundle of continuously hollow semipermeable fibers in said shell and extending through said end openings of said shell, said bundle terminating at each end thereof in a solidified castable resin tubesheet joining said fibers to each other, each said tubesheet having an axially extending inner portion sealingly interfitting with said shell within the opening in each outer end portion to thereby define a dialysate chamber between an inner end surface of each said inner portions, each said tubesheet including a frusto-conical portion integral with said inner portion and extending axially outwardly therefrom and terminating in an outer end planar surface exposing the open ends of said fibers therein, the frusto-conical portion of each tubesheet providing a peripheral surface tapering axially outwardly toward the associated end planar surface, and blood chamber means comprising a separate header adjacent and associated with each tubesheet and forming a blood chamber communicating with the outer end planar surface of the adjacent tubesheet, means for effecting an axially elongated fluid seal between each header and adjacent tubesheet entirely around the periphery of each frusto-conical portion comprising an integral tapered portion of the adjacent header coextensive axially with a portion of said axially tapering peripheral surface of the associated frusto-conical portion in pressure sealing engagement therewith, blood chamber



sealing means on the peripheral surface of each outer end portion of said shell comprising a tapered portion of the shell extending toward the outer end of said shell in the direction from said central portion axially outwardly and radially inwardly, and means for effecting a gas seal between each header and each said tapered portion respectively of said shell outer end portion entirely around the latter comprising a skirt of each header at the inner end thereof extending around said tapered portion of the associated shell outer end portion in gas tight sealing engagement.

4,414,111

SHAPED COMPOSITE ADSORBENT AND A PROCESS FOR PREPARING THE SAME

Toshiyuki Iwaisako, and Akio Inoue, both of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP81/00379, § 371 Date May 17, 1982, § 102(e) Date May 17, 1982, PCT Pub. No. WO82/02006, PCT Pub. Date Jun. 24, 1982

PCT Filed Dec. 15, 1981, Ser. No. 385,410

Claims priority, application Japan, Dec. 15, 1980, 55-175769

Int. Cl.³ B05D *3/10, 5/00*

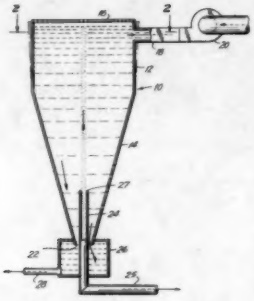
U.S. Cl. 210—500.2 **11 Claims**

1. A shaped composite adsorbent made of a shaped porous material of a skin-core structure comprising a powdery ion-exchange type adsorbent and an acrylonitrile polymer containing 0.1 to 20% by weight of an ionic group and wherein said shaped porous material has a semi-permeable skin layer of 0.01 to 1μ in thickness and a void volume rate of 50 to 90%.

4,414,112
OIL/WATER SEPARATOR

Robert E. Simpson, Dallas; Billy H. Amstead, Austin, and Charles R. Barden, Bastrop, all of Tex., assignors to Recovery Technology Associates, Daingerfield, Tex.

Filed Jan. 29, 1982, Ser. No. 343,995
Int. Cl.³ B04C 5/00
U.S. Cl. 210—512.1 **20 Claims**



1. A separator comprising elements designed and positioned to separate a feed mixture consisting essentially of liquids of differing densities including a substantially cylindrical vortex generating chamber having a vertical axis, a liquid entry duct communicating at one end tangentially with said vortex generating chamber at a point near the upper edge of said vortex generating chamber, pump means having inlet and outlet ports, the outlet port of said pump means communicating with the other end of said liquid entry duct, a conical truncated accelerating chamber affixed at its larger end coaxially to the bottom of said vortex generating chamber and having its truncated apex comprising an orifice directed downwardly, a thin-walled vortex finding tube extending through said orifice and within said accelerating chamber substantially along the vertical axis of said accelerating chamber a distance into said accelerating chamber sufficient to provide separating efficiences up to 94%, first liquid collecting means communicating with said orifice and second liquid collecting means communicating with said vortex finding tube.

4,414,113
LIQUID PURIFICATION USING REVERSE OSMOSIS HOLLOW FIBERS

Terrance LaTerra, Old Bridge, N.J., assignor to Ecodyne Corporation, Chicago, Ill.

Filed Sep. 29, 1982, Ser. No. 427,863
Int. Cl.³ B01D 13/00, 31/00
U.S. Cl. 210—636 **15 Claims**

1. A method for removing dissolved solids and suspended particuate matter from a liquid to be treated, comprising the steps of:

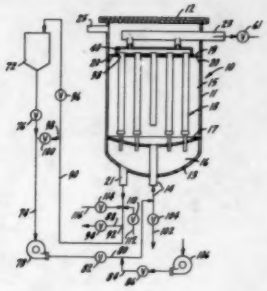
(a) passing a feedstream of liquid to be treated into a pressure vessel having a plurality of filter elements vertically positioned therein;

(b) directing the liquid to be treated through an outer filter septum positioned around the filter elements for removal of suspended particulate matter in the liquid to be treated;

(c) directing the liquid to be treated that passes through the filter septum through a layer of hollow RO fibers spirally wrapped around formaninous center cores of the filter elements such that the liquid to be treated flows in a direction from the outside of the filter elements towards the foraminous center cores, so as to cause substantially pure permeate liquid to permeate into the center bores of the hollow RO fibers and concentrate liquid to pass into the foraminous center cores;

(d) collecting the permeate liquid from the center bores of the hollow RO fibers in a common collector manifold and removing the collected permeate liquid from the pressure vessel;

(e) collecting at least a portion of the concentrate liquid from the center cores in a common concentrate liquid collection compartment and removing the collected concentrate liquid from the pressure vessel;



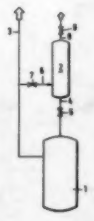
(f) periodically terminating passage of the liquid to be treated into the pressure vessel and directing backwash liquid into the concentrate liquid collection compartment and then across the layer of hollow RO fibers and the filter septum into the pressure vessel, so as to remove particular matter that is trapped in the hollow RO fibers and the filter septum and;

(g) removing the backwash liquid along with the suspended particulate matter from the pressure vessel.

4,414,114
DISCHARGE OF GASES FROM SUBMARINE DESALINATION PLANTS

Burkhard Drude; Thomas Peters, both of Erlangen, Fed. Rep. of Germany, and Eberhard Klapp, deceased, late of Erlangen, Fed. Rep. of Germany (by Ursula Klapp, executrix), assignors to Mannesmann Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 83,762, Oct. 11, 1979, abandoned. This application Apr. 4, 1980, Ser. No. 137,242
Claims priority, application Fed. Rep. of Germany, Oct. 12, 1978, 2844407
Int. Cl.³ B01D 13/00
U.S. Cl. 210—652 **7 Claims**



1. Method of discharging gases from a deep-sea submarine desalination vessel which provides freshwater under high pressure, comprising the steps of

intermittently discharging the gases from the vessel into a second vessel;

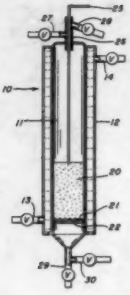
using the pressurized freshwater for pressurizing the gas in the second vessel; and

discharging the pressurized gas from the second vessel into the surrounding sea.

4,414,115
REMOVAL OF COPPER AND ZINC SPECIES FROM BAYER PROCESS LIQUOR BY FILTRATION

Paul J. The, Murrysville, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 21, 1981, Ser. No. 332,442
Int. Cl.³ C02F 1/52
U.S. Cl. 210—665 **6 Claims**



1. A process for decreasing the level of copper or zinc impurities in an alkali metal aluminate solution without increasing the sulfide content of the solution, said process comprising

providing a filter bed comprising granular particles of a substance containing about 40 to 100% Fe_2O_3 by weight, said particles having an average particle size of about 100 to 400 μm,

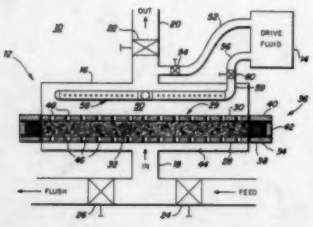
coating said particles with zinc sulfide prior to filtering, by passing a zinc sulfide solution through the bed and then washing in order to avoid sulfide contamination of the aluminate solution, and

filtering the aluminate solution through the filter bed.

4,414,116
SELF BACK-FLUSHING MAGNETIC SEPARATOR PROCESS

John J. Nolan, W. Wareham, Mass., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Division of Ser. No. 39,671, May 16, 1979, abandoned, which is a continuation of Ser. No. 912,542, Jun. 5, 1978, abandoned. This application Apr. 16, 1980, Ser. No. 140,753
Int. Cl.³ B01D 35/06
U.S. Cl. 210—695 **4 Claims**

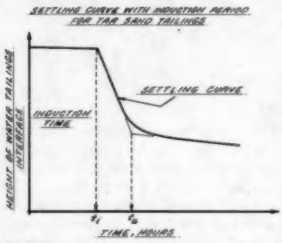


1. A self-flushing magnetic separator method comprising: feeding above ambient pressure and temperature a liquid medium to be separated to the upstream end of a ferromagnetic matrix; establishing a magnetic field in said matrix; collecting the separated liquid above ambient pressure and temperature at the downstream end of the matrix; accumulating at least one matrix volume of the separated liquid at above ambient pressure and temperature adjacent said downstream end of the matrix; stopping feeding to the upstream end of the matrix, trapping the accumulated separated liquid; removing said magnetic field; and venting the upstream end of the matrix to lower pressure to cause the accumulated liquid to boil and establish increased vapor volume to drive the boiling liquid through the matrix, and back-flush the matrix with the self-perturbed boiling liquid; said feeding and collecting steps being at sufficiently high pressure and temperature above ambient to produce boiling of said trapped separated liquid when said upstream end of the matrix is vented to said lower pressure.

4,414,117
DECARBONATION OF TAILINGS SLUDGE TO IMPROVE SETTLING

Raymond N. Yong, and Amar J. Sethi, both of Beaconsfield, Canada, assignors to Suncor, Inc., Toronto, Canada

Continuation-in-part of Ser. No. 262,143, May 11, 1981, abandoned. This application Sep. 10, 1982, Ser. No. 416,729
Int. Cl.³ C02F 11/14
U.S. Cl. 210—710 **12 Claims**


SETTLING CURVE WITH INDUCTION PERIOD FOR TAR SAND TAILINGS
SETTLING CURVE
INDUCTION TIME
HEIGHT OF WATER TAILINGS INTERFACE
TIME, HOURS

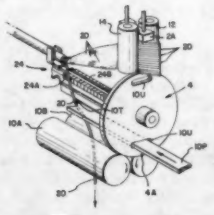
1. A process for reducing the time for settlement during flocculation of a tailings sludge containing mineral solids obtained from recovery of bitumen from tar sands wherein said sludge, when treated with a starch flocculant, has an induction time before settlement begins, which comprises adding an additive to said sludge to remove essentially all of the carbonate and bicarbonate ions present in said sludge and then adding as said starch flocculant, an effective amount of a hydrolyzed wheat, corn or potato starch obtained by the aqueous hydrolysis of the starch in the presence of an insoluble metal salt formed in-situ, and settling the solids from the sludge.

10. The process of claim 1 wherein sand surcharging is used to effect a compaction of the sludge.

4,414,118
METHOD AND COMPOSITIONS FOR DISSOLVING SILICATES IN SUBTERRANEAN FORMATION

Joseph R. Murphey, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Oct. 30, 1981, Ser. No. 316,692
Int. Cl.³ E21B 43/27
U.S. Cl. 252—8.55 C **18 Claims**



1. A retarded aqueous acid composition for dissolving siliceous materials comprising:

(a) a mineral acid other than hydrofluoric acid;
(b) a compound having the formula

$$(T^{+3})_n(M^{+1})_z(F^{-a})_y$$

the hydrates of said compound and mixtures thereof wherein T is selected from the group consisting of cations of zirconium, chromium, and mixtures thereof·
M is selected from the group consisting of hydrogen and ammonium;
z is 0 to 4; and

$$3n+z=ay$$

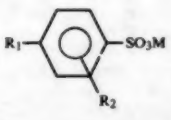
wherein said aqueous acid composition has a pH value no greater than 2 and the fluoride ion of said compound is present in said composition in an amount of at least 0.05 gram-moles of fluoride ion per liter of composition.

4,414,119
INJECTIVITY OF CRUDE OIL AND PETROLEUM SULFONATE SLUGS BY THE ADDITION OF AN ALKYLBENZENE SULFONATE

Roy B. Duke, Jr., Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Jan. 4, 1982, Ser. No. 336,731
Int. Cl.³ E21B *43/22*
U.S. Cl. 252—8.55 D **5 Claims**

1. A process for inhibiting the formation of insoluble precipitates in a crude oil sulfonation product wherein said crude oil sulfonation product is a component of a microemulsion that is to be injected into a subterranean, oil-bearing formation to recover oil therefrom, the process comprising the steps of:
(a) mixing said crude oil sulfonation product, a hydrocarbon, water, and a cosurfactant to form said microemulsion;
(b) filtering said microemulsion through a diatomaceous earth filter medium; and thereafter
(c) adding an alkylbenzene sulfonate to said microemulsion at a concentration such that about 1 to about 40 weight percent of the resulting sulfonate groups in said microemulsion is attributable to said alkylbenzene sulfonate and the remaining weight percent of said sulfonate groups is attributable to said crude oil sulfonation product, and wherein said alkylbenzene sulfonate is defined by the formula:



wherein R_1 and R_2 are alkyl groups containing about 10 to about 20 carbon atoms each and M is a monovalent cation; and
(d) blending said microemulsion for a time sufficient to obtain uniform dispersion of said alkylbenzene sulfonate in said microemulsion, which substantially inhibits the formation of the insoluble precipitates therein.

4,414,120
ENHANCED OIL RECOVERY

Thomas P. Malloy, Lake Zurich, and Raymond J. Swedo, Mt. Prospect, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Jun. 18, 1981, Ser. No. 274,914
Int. Cl.³ E21B *43/22*
U.S. Cl. 252—8.55 D **5 Claims**

1. A process for the enhanced recovery of oil from a subterranean reservoir of oil which comprises the introduction of a three component aqueous surfactant slug into said subterranean reservoir of oil to enhance the displacement of oil from said reservoir; the three components being:
(i) from about 1% to about 10% of a sulfonate of an alkylated gas oil having a molecular weight of from about 300 to about 500, wherein said alkyl substituent contains from about 6 to about 18 carbon atoms, and wherein said gas oil has been obtained from the thermal cracking of coal, alkylation of said gas oil having been conducted in the presence of an alkylation catalyst;
(ii) from about 1% to about 10% of a lower alkyl alcohol containing from about 3 to about 6 carbon atoms; and
(iii) from about 0.1% to about 2% of a non-ionic surfactant which is an ethoxylated normal alcohol containing from about 12 to about 15 carbon atoms;
wherein said three component aqueous surfactant is present in a sufficient amount to reduce the interfacial tension between the oil and water.

4,414,121
AQUEOUS LUBRICATING COMPOSITIONS

Robert P. Aiello, Cypress, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 14, 1981, Ser. No. 330,415
Int. Cl.³ C10M *1/06, 1/28*
U.S. Cl. 252—49.5 **9 Claims**

1. An aqueous metal-working lubricant comprising a major amount of water and a minor amount of an emulsion-type soluble oil comprising a low viscosity index (LVI) lubricating oil; an emulsifier comprising sodium sulfonates; a soluble oil coemulsifier base comprising naphthenic acids, potassium hydroxide, antirust and antimicrobial agents; and an amount of block copolymers of ethylene oxide and propylene oxide or other alkylene oxides, generally known as polyalkylene glycols, having a molecular weight between about 800 and about 8,000, effective to improve the metal-working capability of said soluble oil.

4,414,122
OXIDIZED HYDROCARBON-SOLUBLE POLYAMINE-MOLYBDENUM COMPOSITIONS

C. Thomas West, and Robert J. Basalay, both of Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 190,590, Sep. 25, 1980, Pat. No. 4,357,149.
This application Sep. 14, 1981, Ser. No. 301,751
Int. Cl.³ C10M *1/32, 1/54*
U.S. Cl. 252—49.7 **6 Claims**

1. An improved hydrocarbon-soluble molybdenum composition which comprises reaction product of a molybdenum compound which produces ammonium molybdate, molybdic acid, or molybdic oxide under reaction conditions and an oxidized hydrocarbon-soluble polyamine compound selected from the group consisting of oxidized polyamine Mannich products and oxidized substituted dicarboxylic acid compound-polyamine reaction products, wherein a hydrocarbon-soluble polyamine compound is reacted at a temperature of 38° C. to 427° C. and a subatmospheric, atmospheric, or superatmospheric pressure with an oxidizing agent comprising an oxygen-containing material to produce said oxidized hydrocarbon-soluble polyamine compound prior to reaction with the molybdenum compound, the reaction product of said molybdenum compound and said oxidized hydrocarbon-soluble polyamine compound having been prepared by contacting said molybdenum compound with said oxidized hydrocarbon-soluble polyamine compound at a ratio of about 0.5 to 10 moles of molybdenum compound per mole of amine in said oxidized hydrocarbon-soluble polyamine compound at a temperature within the range of about 50° C. to 300° C.

3. An improved hydrocarbon-soluble molybdenum composition which comprises an oxidized reaction product of a molybdenum compound which produces ammonium molybdate, molybdic acid, or molybdic oxide under reaction conditions and a hydrocarbon-soluble polyamine compound selected

from the group consisting of polyamine Mannich products and substituted dicarboxylic acid compound-polyamine reaction products, wherein a reaction product of the molybdenum compound and the hydrocarbon-soluble polyamine compound is reacted at a temperature of 38° C. to 427° C. and a subatmospheric, atmospheric, or superatmospheric pressure with an oxidizing agent comprising an oxygen-containing material to produce an oxidized hydrocarbon-soluble polyamine-molybdenum compound, the reaction product of said molybdenum compound and said hydrocarbon-soluble polyamine compound having been prepared by contacting said molybdenum compound with said hydrocarbon-soluble polyamine compound at a ratio of about 0.5 to 10 moles of molybdenum compound per mole of amine in said hydrocarbon-soluble polyamine compound.

5. A lubricant comprising a lubricating base oil and an effective friction-modifying amount of the hydrocarbon-soluble molybdenum composition of claim 1 or claim 3.

6. A gasoline containing sufficient hydrocarbon-soluble polyamine-molybdenum composition of claim 1 or claim 3 to supply about 0.1–10,000 parts of molybdenum per one million parts of gasoline.

4,414,123

MARINE DIESEL CYLINDER OILS CONTAINING POLYOXYETHYLENE SORBITOL LANOLIN FOR IMPROVED SPREADABILITY

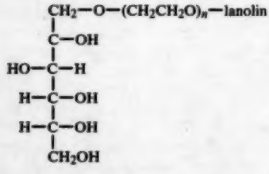
Benjamin H. Zoleski, Beacon, and Rodney L. Sung, Fishkill, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Jun. 1, 1981, Ser. No. 268,955

Int. Cl.³ C10M *1/20*

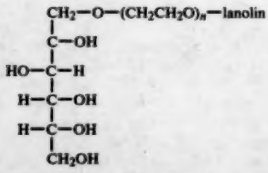
U.S. Cl. 252—52 A **10 Claims**

1. A process for improving the spreadability of a diesel engine cylinder lubricant having a total base number ranging from about 50 to 100 owing to the presence therein of alkaline detergents which comprises blending with said lubricant a spreadability improving amount of at least 0.5 weight percent thereof of at least one polyoxyethylene sorbitol lanolin of the formula:



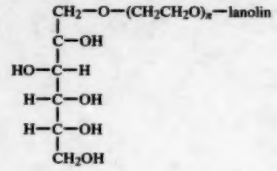
wherein n is an integer ranging from 14 to 16.

3. In a diesel engine cylinder lubricant comprising a major amount of an oil having an SAE viscosity of about 50 and a total base number ranging from about 50 to about 100 due to the presence of alkaline detergents, the improvement comprising in the presence therein of at least 0.5 weight percent thereof of a spreadability improving amount of at least one nonionic detergent polyoxyethylene sorbitol lanolin of the formula:



wherein n is an integer ranging from 14 to 16.

5. A process for lubricating the moving metal surfaces of a marine diesel engine cylinder which comprises causing a film of a diesel oil having a total base number ranging from about 50 to about 100 due to the presence therein of alkaline detergents to spread on said surfaces by incorporating in said diesel oil a spreadability improving amount of at least one nonionic detergent polyoxyethylene sorbitol lanolin of the formula:



wherein n ranges from 14 to 16.

4,414,124

METHOD OF PRODUCING BARIUM-FERRITE SERIES POWDER

Hiroshi Endo; Masashi Awa; Shigeo Iiri, all of Yokohama; Toshihiko Oguchi, Kawasaki; Isao Suzuki, Yokosuka; Naoyuki Hirate, and Masaru Hayashi, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 3, 1981, Ser. No. 250,555

Claims priority, application Japan, May 8, 1980, 55-59943

Int. Cl.³ C04B *35/26*

U.S. Cl. 252—62.63 **13 Claims**

1. A method of producing barium-ferrite series microcrystalline powders having a general formula:

$$BaO.n(Fe_{1-m}M_m)_2O_3$$

where M is at least one substituent component selected from the group consisting of Co, Ti, Ni, Mn, Cu, Zn, In, Ge and Nb, m is 0 to 0.2, and n is 5.4 to 6.0, comprising:

providing an alkaline aqueous solution having an alkalinity of at least 0.01 N and containing barium ions, iron (III) ions and, optionally ions of the substituent component M dissolved therein in amounts sufficient to provide a molar ratio of 1:2n(1−m):2nm in the crystalline powder of said formula by adding a first aqueous solution to a second aqueous solution of an alkali, said first aqueous solution being prepared in advance by dissolving the water-soluble compounds of barium, iron (III) and optionally substituent component M in water;

heating said alkaline aqueous solution at 150° to 300° C. at a constant volume, thereby precipitating a precursor of said crystalline powder, said precursor substantially bearing regular hexagonal plate-shaped crystal contour; and

baking said precursor at 700° to 1,000° C. to completely crystallize the precursor, thereby obtaining the crystalline powder having a particle size of 0.5 μm or less.

4,414,125

ALKALI METAL OR AMINE SALTS OF A MIXTURE OF 2- AND 3-ALKYLADIPIC ACIDS AS CORROSION INHIBITORS

Hans S. H. Keil, deceased, late of Marl, Fed. Rep. of Germany (by Inge Keil, legal representative); Helmut Alfs, Marl, and Klaus Schulze, Haltern-Lippramsdorf, both of Fed. Rep. of Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Dec. 1, 1980, Ser. No. 211,593

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1979, 2948503

Int. Cl.³ C23F *11/14, 11/12, 11/06*

U.S. Cl. 252—75 **11 Claims**

1. A corrosion inhibited composition comprising

(a) water
(b) a glycol; a polyglycol; a polyglycol ether; a thickener for aqueous compositions; or a mineral oil and an emulsifier; and
(c) an alkali metal salt or a water soluble aliphatic amine salt of a mixture of 2- and 3-C_{6-12}-alkyladipic acids, the amount of this acid component being effective as a corrosion inhibitor, and the pH of the composition being 7–9.

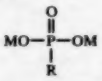
4,414,126

AQUEOUS COMPOSITIONS CONTAINING CORROSION INHIBITORS FOR HIGH LEAD SOLDER

Joe C. Wilson, Woodhaven, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Oct. 22, 1981, Ser. No. 313,687
Int. Cl.³ C09K *5/00*
U.S. Cl. 252—78.3 **13 Claims**

1. A corrosion resistant, alcohol-based antifreeze concentrate comprising a water-miscible alcohol and a corrosion inhibiting amount of a high lead solder corrosion inhibitor consisting essentially of a mixture of an alkali metal mercaptobenzothiazole and a phosphorus compound having the formula:



wherein R is a monovalent aliphatic group containing 1 to about 18 carbon atoms and M is a monovalent cation individually selected from the group consisting of hydrogen, an alkali metal, ammonium, alkylammonium, and alkyleneammonium with the proviso that only one M can be hydrogen.

4,414,127

CONTACT LENS CLEANING SOLUTIONS

Cherng-Chyi Fu, Sunnyvale, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto., Calif.

Filed Jul. 6, 1981, Ser. No. 280,035
Int. Cl.³ C11D *9/42*; D06L *3/00*; B08B *7/00*
U.S. Cl. 252—95 **29 Claims**

15. An article of manufacture comprising two packages from which aliquots are combined to make a contact lens cleaning composition wherein
one package contains a granular or aqueous peroxide and the other contains an aqueous solution comprising
a catalytic amount of water soluble transition metal catalyst in the form of an inorganic or organic salt;
a surfactant which is (a) a monocarboxylated, dicarboxylated or sulfonated, fatty acid substituted imidazoline amphoteric surfactant, (b) a sulfonated amido-amine amphoteric surfactants or (c) a coco-hydrolyzed animal protein anionic surfactant.

4,414,128

LIQUID DETERGENT COMPOSITIONS

Pierre C. E. Goffinet, Brussels, Belgium, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jun. 8, 1981, Ser. No. 271,165
Int. Cl.³ C11D *3/44, 10/04, 17/08*
U.S. Cl. 252—111 **23 Claims**

1. An aqueous liquid detergent composition comprising:
(a) from 1% to 20% of surfactant selected from synthetic anionic, nonionic, amphoteric and zwitterionic surfactants and mixtures thereof,
(b) from 0.5% to 10% of terpene selected from mono- and sesquiterpenes and mixtures thereof, the weight ratio of surfactant:terpene lying in the range from 5:1 to 1:3 and
(c) from 0.5 to 10% of a polar solvent having a solubility in water at 25° C. in the range from 0.2% to 10%, said polar solvent being selected from the group consisting of benzyl alcohol, polyethoxylated phenols containing from 2 to 6 ethoxy groups, phenylethyl alcohol, mono C_6–C_9 alkyl ethers of ethylene glycol, di-C_4–C_9 alkyl ethers of ethylene glycol, and mixtures thereof.

16. A composition according to claim 1 comprising additionally from 0.005 to 2% of an alkali metal, ammonium or alkanolammonium soap of a C_{13}–C_{24} fatty acid.

4,414,129

FREE-FLOWING BUILDER BEADS AND DETERGENTS

David P. Joshi, Piscataway, N.J., assignor to Colgate Palmolive Company, New York, N.Y.

Continuation of Ser. No. 275,023, Jun. 18, 1981, abandoned, which is a continuation of Ser. No. 177,784, Aug. 13, 1980, Pat. No. 4,310,431, which is a continuation-in-part of Ser. No. 661,471, Feb. 26, 1976, abandoned. This application Jun. 4, 1982, Ser. No. 384,951
Int. Cl.³ C11D *3/075, 3/08, 11/02, 17/06*
U.S. Cl. 252—135 **13 Claims**

1. A spray-dried base bead having detergent building properties comprising from about 45 to about 85 percent by weight of an alkali metal phosphate wherein from about 30 to about 60 percent of the phosphate is hydrated and the remainder is anhydrous, from about 5 to about 15 percent by weight of a sodium silicate having an $Na_2O:SiO_2$ ratio of from about 1:1.6 to about 1:3.4 and from about 5 to about 15 percent water of hydration in the hydrated phosphate, the bead being essentially free of organic surfactant, organic detergent or soap when spray-dried; said bead having a structure of microcrystals and amorphous solid interconnected as an irregular network within the bead, the network defining interconnected, irregularly shaped passageways, said passageways comprising a reticular void space within the bead and interconnecting to discrete openings on the external surface of the bead; the bead having a specific gravity of from about 0.5 to about 0.8; and at least 90 percent of the beads having a particle size distributed between 20 mesh and 200 mesh U.S. sieve series; and when said beads are loaded with up to about 40 percent by weight nonionic organic surfactant, the resulting surfactant loaded beads have a flowability of at least about 70 percent that of clean dry sand.

4,414,130

READILY DISINTEGRABLE AGGLOMERATES OF INSOLUBLE DETERGENT BUILDERS AND DETERGENT COMPOSITIONS CONTAINING THEM

Bao-ding Cheng, Kendall Park, N.J., assignor to Colgate Palmolive Company, New York, N.Y.

Continuation of Ser. No. 715,124, Aug. 17, 1976, abandoned. This application Nov. 21, 1980, Ser. No. 209,273
Int. Cl.³ B01J *39/14*; C02F *1/42*; C11D *3/12, 17/06*
U.S. Cl. 252—140 **2 Claims**

1. A readily disintegratable insoluble detergent builder particulate agglomerate comprising about 50% by weight of hydrated zeolite 4A having a particle diameter of about 0.01 to 10

microns, to about 20% by weight of sodium silicate having a $Na_2O:SiO_2$ ratio of about 1:2.4, about 10% by weight of sodium carboxymethylcellulose and about 20% by weight of corn starch, wherein the zeolite is combined with the sodium silicate, sodium carboxymethylcellulose and corn starch in the presence of about 15% by weight water.

2. A readily disintegratable insoluble detergent builder agglomerate comprising about 50% by weight initially anhydrous zeolite X, having a particle diameter in the range of from about 0.01 to 10 microns, about 25% by weight of a nonionic surfactant, said nonionic surfactant being an ethoxylation product of a 14 to 15 carbon atom chain fatty alcohol, having an average of 11 ethylene oxide units; and about 25% by weight of potato starch; wherein the zeolite is combined with the nonionic surfactant and potato starch in the presence of about 15% by weight water.

4,414,131

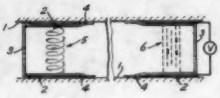
GUEST-HOST LIQUID CRYSTALLINE COMPOSITION

Nicholas L. Sethofer, and Michael C. Harper, both of San Jose, Calif., assignors to Timex Corporation, Waterbury, Conn.

Continuation of Ser. No. 319,349, Dec. 9, 1981, abandoned. This application Jan. 13, 1983, Ser. No. 457,781

Int. Cl.³ G02F 1/13; C09K 3/34

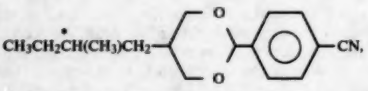
U.S. Cl. 252—299.1 **5 Claims**



1. A guest/host nematic liquid crystalline composition having low optical birefringence and low threshold voltage comprising:

(a) host nematic compounds: trans-alkyl pentylcyclohexyl dioxanes, trans-alkyl cyanophenyl dioxanes, trans-alkyl pentylcyclohexyl cyclohexyl dioxanes, trans-alkyl alkylcyclohexyl phenyl dioxanes and trans-cyanophenyl alkyl dioxanyl benzoates,

(b) a chiral nematic compound having the formula:



(c) a guest pleochroic dye.

4,414,132

OLEFIN POLYMERIZATION CATALYST COMPOSITIONS AND A PROCESS FOR THE POLYMERIZATION OF OLEFINS EMPLOYING SUCH COMPOSITIONS

Brian L. Goodall; Adrianus A. van der Nat, and Willem Sjardijn, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 145,566, May 1, 1980. This application Oct. 30, 1981, Ser. No. 316,475

Claims priority, application United Kingdom, May 17, 1979, 7917240

Int. Cl.³ C08F 4/64

U.S. Cl. 502—169 **31 Claims**

1. An olefin polymerization catalyst composition comprising an organoaluminum compound, a selectivity control agent and a solid component which has been obtained by halogenating a magnesium compound of the formula $MgR'R''$ wherein R' is an alkoxide or aryloxide group and R'' is an alkoxide or aryloxide group or halogen, with a halide of tetravalent titanium in the presence of a halohydrocarbon and an electron donor, contacting the halogenated product with a tetravalent titanium halide, washing it to remove unreacted titanium compounds, and recovering the solid product.

4,414,133

CATALYTIC COMPOSITION

Masayuki Otake; Masakatsu Hatano, both of Yokohama; Toru Koyama, Machida; Masayoshi Murayama, Yokohama, and Kazunori Oshima, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Jan. 25, 1982, Ser. No. 342,238

Claims priority, application Japan, Feb. 5, 1981, 56-16196

Int. Cl.³ B01J 27/14, 29/16, 29/00, 29/10

U.S. Cl. 502—179 **3 Claims**

1. A catalytic composition represented by the formula:

$$(Mo)_a(W)_b(Bi)_c(Pb)_d(Sb)_e(A)_f(B)_g(C)_h(P)_m(O)_n$$

in which A is iron and/or chromium, B is cerium and/or magnesium and C is potassium and/or lithium; and a, b, c, d, e, f, g, h, m and n stand for the numbers of atoms for molybdenum, tungsten, bismuth, lead, antimony, A, B, C, phosphorus and oxygen elements respectively, wherein, given that $a+b=12$,

$0 \leqq b \leqq 7$, $0.4 \leqq c \leqq 7$, $2 \leqq d \leqq 12$,

$0.1/22 \leqq e/a \leqq 25/22$, $0.05/22 \leqq f/a \leqq 3/22$,

$0 \leqq g/a \leqq 2/22$, $0 \leqq h/a \leqq 3/22$,

$0 \leqq m/a \leqq 7/22$, and

n is the numbers of oxygen necessary to satisfy the valences of atoms for the individual constituent elements other than oxygen.

4,414,134

IMPREGNATING CATALYSTS

Maria S. Friedrich, Lyndhurst; Dev D. Suresh, Macedonia, and Robert K. Grasselli, Chagrin Falls, all of Ohio, assignors to The Standard Oil Co., Cleveland, Ohio

Filed Jan. 5, 1981, Ser. No. 222,820

Int. Cl.³ B01J 27/14, 21/02, 27/02, 29/16

U.S. Cl. 502—204 **8 Claims**

1. A process for improving the catalytic performance of a substantially crystalline iron bismuth molybdate oxide complex interim catalyst to thereby produce a product catalyst of the formula:

$$A_aB_bC_cBi_dFe_eMo_fO_x$$

wherein

A is at least one element selected from the Group I, II and III elements;

B is one or more Group VIII elements other than Fe;

C is P, As, Sb, S, Te and/or Sn; and

wherein

a is 0.1–12;

b is 0.1–12;

c is 0.1–12;

d is greater than 0–12;

e is 0.1–12;

f is 0.1–12; and

x is a number determined by the valence requirements of the other elements present,

said interim oxide complex catalyst being produced by forming a pre-catalyst and thereafter calcining said pre-catalyst in an oxygen-containing gas, said process comprising (a) impregnating said interim catalyst with a solution of at least one element from Groups IA, IB, IIB, IIIA and IIIB of the Periodic Table, and (b) thereafter calcining the impregnated interim oxide complex in an oxygen-containing gas to thereby form said product catalyst, none of the Group IA elements incorporated into said catalyst by impregnation being derived from a molybdate or silicate.

4,414,135

SILVER-BASED CATALYST CONTAINING BROMINE AND/OR FLUORINE AS AN ANIONIC COMPONENT FOR THE PRODUCTION OF ETHYLENE OXIDE

Naohiro Nojiri, and Yukio Sakai, both of Ami, Japan, assignors to Mitsubishi Petrochemical Co. Ltd., Tokyo, Japan

Filed Feb. 18, 1982, Ser. No. 349,977
Claims priority, application Japan, Apr. 30, 1981, 56-65435
Int. Cl.³ B01J *27/08, 27/12*
U.S. Cl. 502—224 **8 Claims**

1. A catalyst for the production of ethylene oxide by oxidation of ethylene, said catalyst comprising

(A) silver,

(B) (1) sodium in an amount of more than 1000 ppm (mg/kg of catalyst) based on the catalyst and (2) cesium as a cationic component, the amount of cesium being smaller than that of sodium and ranging from 10 ppm to 0.5% by weight based on the catalyst, and

(C) at least one halogen element selected from bromine and fluorine as an anionic component, the amount of the halogen element being from 5 ppm to 0.1% by weight based on the catalyst.

4,414,136

CATALYSTS FOR ETHYLENE OXYCHLORINATION

Ronald J. Convers, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Apr. 2, 1982, Ser. No. 364,957
Int. Cl.³ B01J *27/10*
U.S. Cl. 502—225 **5 Claims**

1. A method for preparing ethylene oxychlorination catalysts comprising impregnating an alumina carrier with copper chloride or mixtures of copper chloride and Group I and Group II metal chlorides, wherein the alumina carrier has substantially no pores less than 150 Ångstroms in diameter and a specific surface area of at least 30 square meters per gram.

4,414,137

CATALYTICALLY ACTIVE AMORPHOUS SILICA

Dean A. Young, Yorba Linda, and Jeffery W. Koepke, La Habra, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Filed Mar. 9, 1982, Ser. No. 356,351
Int. Cl.³ B01J *21/08, 27/14, 27/24*
U.S. Cl. 502—162 **25 Claims**

1. A method for preparing an amorphous silica-containing product comprising forming a hydrogel or precipitate in a reaction mixture comprising water, silicate anions, and an organic reactant selected from the group consisting of amines having a pK_a value above about 10.0, quaternary ammonium cations having a nitrogen atom bonded to four carbon atoms, quaternary phosphonium cations having a phosphorus atom bonded to four carbon atoms, precursors of the foregoing, and mixtures thereof, and dehydrating the resultant hydrogel or precipitate to yield a product containing amorphous silica.

4,414,138

FLUID CATALYTIC CRACKING CATALYST

Randall H. Petty, Nederland, and Burton H. Bartley, Port Arthur, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 180,357, Aug. 22, 1980, Pat. No. 4,344,926.
This application Jun. 2, 1982, Ser. No. 384,422
Int. Cl.³ B01J *29/16, 21/04, 23/18*
U.S. Cl. 502—73 **11 Claims**

1. A composition of matter as a component in catalytic cracking compositions which consists essentially of a composite of active alumina and 0.5 to 1 weight percent bismuth as bismuth oxide prepared by forming a cogel of active alumina and a soluble bismuth salt, drying said gel and calcining the resulting composite at a temperature in the range of 1000° to 1200° F. for at least one hour.

4. A catalytic cracking catalyst composition comprising a major portion of a cracking catalyst composed of a crystalline zeolite in a supporting matrix in intimate admixture with a minor portion of a composite of bismuth oxide and active alumina, wherein said composite contains from 0.05 to 25 weight percent bismuth, calculated as the metal.

4,414,139

CATALYST CARRIERS FOR PURIFICATION OF WASTE GAS AND PROCESS FOR PREPARING THE SAME

Takashi Matsuzaka, Fuji; Toshio Ohtsuki, Yokohama; Minoru Komori, Ayase, and Tsutomu Sakuma, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 29, 1982, Ser. No. 428,269
Claims priority, application Japan, Nov. 19, 1981, 56-184428
Int. Cl.³ B01J *21/16*
U.S. Cl. 502—72 **7 Claims**

5. A process for preparing a catalyst carrier for purification of waste gas which comprises admixing at least two of clay materials containing as main ingredients an aluminum oxide and silicon dioxide with a lithium oxide-containing composition to prepare a mixture containing 1 to 5% by weight of a lithium oxide, not less than 20% by weight of an aluminum oxide and not less than 60% by weight of silicon dioxide; molding and calcining said mixture; dipping the calcined product into a solution containing 55 to 90% by weight of alumina sol with a solid content of about 10% to coal Al_2O_3 over the surface layer thereof; heating the coated product; and then making a platinum group element supported on the heat-treated product.

4,414,140

CATALYST FOR STEAM REFORMING

Herbert J. Setzer, Ellington, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 23, 1981, Ser. No. 333,841
Int. Cl.³ B01J *21/04, 23/10, 23/46, 23/74*
U.S. Cl. 502—303 **7 Claims**

1. A sulfur tolerant, high activity steam reforming catalyst consisting essentially of rhodium supported on a lanthanum stabilized alumina or magnesium promoted lanthanum stabilized alumina substrate material.

4,414,141

HYDROTREATING CATALYST

Harvey D. Schindler, Fairlawn, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Continuation of Ser. No. 208,948, Nov. 21, 1980, abandoned.
This application Mar. 31, 1982, Ser. No. 363,914
Int. Cl.³ B01J *21/04, 23/88*
U.S. Cl. 502—314 **9 Claims**

1. A hydrotreating catalyst having an improved catalyst life, comprising:

a catalytically effective amount of nickel and molybdenum supported on an alumina support having a total porosity of

at least 0.5 cc/g and a pore size distribution of from 0.25 to 0.40 cc/g of pores with a diameter of less than 250 Å, 0.10 to 0.25 cc/g of pores with a diameter of from 250–500 Å, from 0.20 to 0.30 cc/g of pores with a diameter of from 500–1500 Å, from 0.05 to 0.15 cc/g of pores with a diameter of from 1500–4000 Å, and from 0.03 to 0.10 cc/g of pores with a diameter of greater than 4000 Å, said catalyst comprised of nickel and molybdenum supported on alumina having been prepared with calcining at a temperature of from 1150 F. to 1300 F.

4,414,142

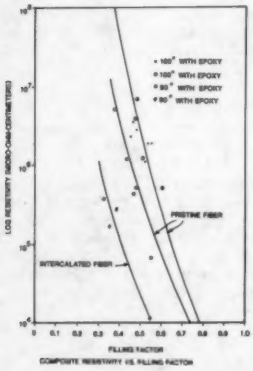
ORGANIC MATRIX COMPOSITES REINFORCED WITH INTERCALATED GRAPHITE

F. Lincoln Vogel, R.D. 3, Whitehouse Station, N.J. 08889, and Claude Zeller, 97 Fan Hill Rd., Monroe, Conn. 06468

Continuation-in-part of Ser. No. 141,586, Apr. 18, 1980, abandoned, which is a continuation-in-part of Ser. No. 449,834, Aug. 23, 1974. This application Nov. 20, 1981, Ser. No. 323,560

Int. Cl.³ H01B *1/04*

U.S. Cl. 252—506 **8 Claims**



1. An electrically conductive composite comprising about 10 to about 65 volume percent relative to the volume of the composite, of an intercalated graphite compound in a remaining volume percent of an organic polymer matrix, wherein, the intercalated graphite compound is selected from:

(a) graphite intercalated with an inorganic or organic acid capable of high disassociation and capable of oxidizing carbon; or

(b) graphite intercalated with a halide salt of a transition element, a Group III A element, or a Group IV A, V A or VI A metal or metaloid element, said salt being capable of coordinating with a halide anion to form an anionic complex; or

(c) graphite intercalated with a Bronsted acid compound capable of donating a proton and making an acidic solution in water and a metal halide selected from boron trihalide, a tetrahalide of a Group IV element or a pentahalide of a Group V element;

said intercalated graphite compound being in the form of flakes, fibers, filaments, a powder or crystals prior to its incorporation into the composite.

4,414,143

CONDUCTOR COMPOSITIONS

John J. Felten, Lewiston, N.Y., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed May 6, 1981, Ser. No. 260,608

Int. Cl.³ H01B *1/02*

U.S. Cl. 252—514 **9 Claims**

1. A palladium/silver metallization suitable for the manufacture of printed conductors which is an admixture of

A. 82–97% by weight of finely divided particles of metallic materials comprising by weight

(1) 40–70 parts silver metal;

(2) 1–25 parts palladium metal; and

(3) 1–25 parts of a base metal material selected from the group consisting of copper metal, copper oxide, cobalt oxide, nickel oxide and mixtures thereof; and

B. 3–18% by weight finely divided particles of inorganic binder dispersed in organic medium, in which admixture the weight ratio of silver to palladium is greater than 2.5, the weight ratio of base metal material to palladium is 0.05–1.5, the weight ratio of base metal material to inorganic binder is 0.1–1.75 and the sum of base metal material and inorganic binder is no more than 18 parts by weight.

4,414,144

AQUEOUS SKIN CLEANER CONTAINING HYDROXYPROPYLATED GUAR GUM AND PARAFFIN SULFONATE/ALKYL SULFATE DETERGENT MIXTURE

Marvin Liebowitz, Edison, and Charles Buda, Middlesex, both of N.J., assignors to Colgate-Palmolive Co., New York, N.Y.

Filed Dec. 30, 1981, Ser. No. 335,990

Int. Cl.³ C11D *1/14, 3/22*

U.S. Cl. 252—548 **9 Claims**

1. A liquid skin cleaner composition comprising an aqueous medium containing, approximately by weight

I. 0.05 to 1.0% of hydroxypropylated guar gum,

II. 10 to 20% of a mixture of

(A) A water soluble paraffin sulfonate salt and

(B) A water soluble C_{8-16} alkyl sulfate salt, the ratio of A/B ranging from 3/1 to 1/3, and

III. At least 50% of water.

4,414,145

PREPARATION AND USE OF A 195M-AU-CONTAINING LIQUID

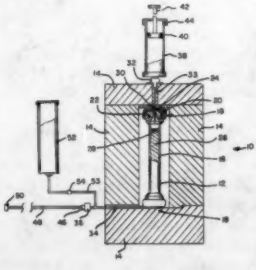
Karel J. Panek, Heiloo, Netherlands, assignor to Byk-Millinkcrodt CIL B.V., Netherlands

Filed Apr. 16, 1980, Ser. No. 140,781

Claims priority, application Netherlands, Apr. 17, 1979, 79/02970

Int. Cl.³ G21G *4/08*

U.S. Cl. 252—645 **73 Claims**



1. A method of preparing a non-toxic, pharmaceutically acceptable, ^{195m}Au-containing liquid capable of direct administration in a living being and substantially devoid of ^{195m}Hg

ions, wherein the ^{195m}Au is a daughter radioisotope of the ^{195m}Hg ion, comprising:

(a) adsorbing ^{195m}Hg on a chemically and radiolytically stable adsorption agent comprising a mercury ion-binding material having a significantly higher affinity for mercury ions than for gold ions, and

(b) eluting the daughter ^{195m}Au radioisotope with an eluant which selectively converts ^{195m}Au ions to an elutable form in the presence of the adsorbed parent ^{195m}Hg radioisotope, and which is non-toxic and pharmaceutically acceptable.

4,414,146

METHOD OF POLYMERIZING ROSIN

Jerome R. Olechowski, Lawrenceville, and Nelson E. Lawson, Trenton, both of N.J., assignors to Union Camp Corporation, Wayne, N.J.

Filed May 5, 1982, Ser. No. 374,974

Int. Cl.[3] **C09F** *1/00;* **B01J** *27/02*

U.S. Cl. 260—97 **19 Claims**

1. The polymerization of a rosin in the presence of a catalytic proportion of an insoluble catalyst which comprises a polymer having pendant organosulfonic acid groups.

4,414,147

METHODS OF DECREASING THE HYDROPHOBICITY OF FIBROBLAST AND OTHER INTERFERONS

Alexander M. Klibanov, Boston, and Robert S. Langer, Cambridge, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 17, 1981, Ser. No. 255,321

Int. Cl.[3] **C07G** *7/00*

U.S. Cl. 260—112 R **3 Claims**

1. A method of reducing the hydrophobicity of interferon, comprising contacting said interferon with an anhydride of a dicarboxylic acid under conditions that allow said interferon to become bonded to said anhydride.

4,414,148

ANTI-CANCER DRUGS FOR THE TREATMENT OF MELANOMAS AND METHOD FOR PREPARING THEREOF

Franz K. Jansen, Castries, and Pierre Gros, Montpellier, both of France, assignors to Sanofi, Paris, France

Filed Apr. 14, 1982, Ser. No. 368,434

Claims priority, application France, Apr. 15, 1981, 81 07596

Int. Cl.[3] **A61K** *39/44;* **C07G** *7/00*

U.S. Cl. 260—112 B **4 Claims**

1. Drugs useful in particular for the treatment of melanomas, wherein they contain an active substance which is a molecule in which the chain A of ricin is associated, by a covalent bond of disulfide type, with the human antimelanoma antibody, Anti p. 97.

4,414,149

GLYCINE[8]-D-ARGININE[24] CALCITONIN

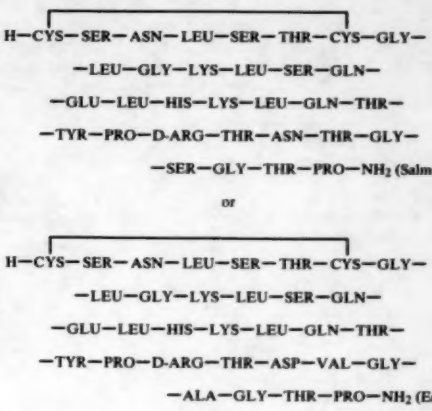
Ronald C. Orlowski, Frankfort, and Jay K. Seyler, Bourbonnais, both of Ill., assignors to Armour Pharmaceutical Company, Tarrytown, N.Y.

Filed Mar. 4, 1983, Ser. No. 471,982

Int. Cl.[3] **C07C** *103/52*

U.S. Cl. 260—112.5 T **4 Claims**

1. Peptides having the structure:



4,414,150

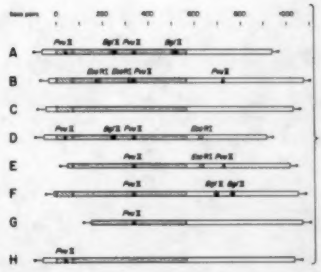
HYBRID HUMAN LEUKOCYTE INTERFERONS

David V. Goeddel, Burlingame, Calif., assignor to Genentech, Inc., South San Francisco, Calif.

Continuation-in-part of Ser. No. 205,579, Nov. 10, 1980. This application Feb. 23, 1981, Ser. No. 237,388

Int. Cl.[3] **C07C** *103/52;* **C07G** *7/00;* **C12P** *21/00, 21/06*

U.S. Cl. 260—112.5 R **7 Claims**



1. An antiviral composition of matter comprising a polypeptide of 165–166 amino acids, optionally having an additional methionine attached to the ordinarily first amino acid at the N-terminus, the amino acid sequence of said polypeptide comprising, in sequence, discrete sub-sequences corresponding in

amino acid identity and number to sub-sequences of different, naturally occurring leukocyte interferons, the amino acid sequence of said polypeptide differing from the amino acid sequence of naturally occurring leukocyte interferons.

4,414,151

CHROMIFEROUS COMPLEX DYESTUFFS, A PROCESS FOR THEIR PREPARATION AND THEIR APPLICATION

Antoine G. L. J. Breda, Craponne, and Jacques G. R. Roussel, Bosc Roger en Roumois, both of France, assignors to P C U K Produits Chimiques Ugine Kuhlmann, Courbevoie, France

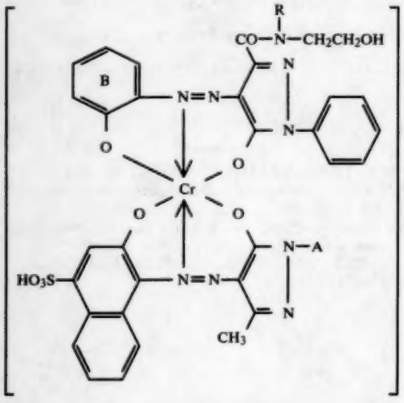
Filed Jul. 13, 1981, Ser. No. 282,902

Claims priority, application France, Jul. 18, 1980, 8015879

Int. Cl.³ C09B *45/00*

U.S. Cl. 260—145 B **14 Claims**

1. The chromiferous complex dyestuffs which, in the acid form, correspond to the general formula



(VI)

in which R represents a hydrogen atom or a β-hydroxyethyl group, A represents a hydrogen atom, a phenyl group or a phenyl group substituted by one or more halogen atoms or alkyl groups of low molecular weight, and the nucleus B may be substituted by one or more chlorine atoms.

4,414,152

BIS ARYL-AZO DERIVATIVES OF 2,3-NAPHTHALENEDIOL

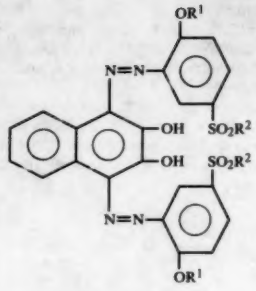
Domenic Santilli, Webster; Jeanne E. Kaeding, and Louis J. Rossi, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 18, 1981, Ser. No. 264,312

Int. Cl.³ C09B *31/02, 31/068, 33/048;* D06P *1/44*

U.S. Cl. 260—185 **3 Claims**

1. A compound of the formula



wherein R^1 is lower alkyl and R^2 is —F or

wherein R^3 and R^4 are hydrogen, lower alkyl, phenyl, naphthyl, or phenyl or naphthyl substituted by lower alkyl and are the same or different.

4,414,153

1,3-DITHIETANE-2-CARBOXYLIC ACID PENICILLIN AND CEPHALOSPORIN DERIVATIVES

Masaru Iwanami, Yokohama; Tetsuya Maeda, Urawa; Yoshinobu Nagano, Niiza; Masaharu Fujimoto, Tokyo; Noriaki Nagano, Ageo; Atsuki Yamazaki, Ichikawa; Kazaharu Tamazawa, Saitama; Kiyoshi Murase, Urawa, and Tadao Shibanuma, Asaka, all of Japan, assignors to Yamanouchi Pharmaceutical Co. Ltd., Tokyo, Japan

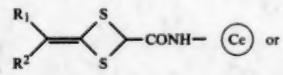
Continuation of Ser. No. 48,015, Jun. 13, 1979, abandoned, which is a division of Ser. No. 913,501, Jun. 7, 1978, Pat. No. 4,198,339. This application Sep. 23, 1981, Ser. No. 304,986

Claims priority, application Japan, Jul. 28, 1977, 52-90772; Feb. 2, 1978, 53-10772; Feb. 22, 1978, 53-19512

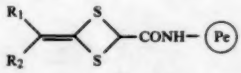
Int. Cl.³ C07D *499/76, 501/36*

U.S. Cl. 260—239.1 **1 Claim**

1. 7-substituted cephalosporin or penicillin derivatives represented by the formula



or



wherein R^1 is a carboxyl group or the functional derivative residue thereof selected from the group consisting of carboxylic acid lower alkyl ester residue, carboxylic acid aralkyl ester residue, a carbamoyl group, N-monoalkylcarbamoyl group, N,N-dialkylcarbamoyl group, a carboazoyl group, and a cyano group; R^2 is a carboxyl group or the functional derivative residue thereof selected from the group consisting of carboxylic acid lower alkyl ester residue, carboxylic acid aralkyl ester residue, a carbamoyl group, N-monoalkylcarbamoyl group, N,N-dialkylcarbamoyl group, a carboazoyl group, and a cyano group, a hydrogen atom, a lower alkyl group, a lower hydroxyalkyl group, a lower alkoxyalkyl group, a lower carboxyalkyl group, a lower arylalkyl group, a lower alkoxy group, a lower alkanoyl group, $R^4S(O)_n$ group wherein R^4 represents a lower

alkyl group and n represents 0, 1 or 2, and aryl group which may have a substituent selected from the group consisting of hydroxyl and alkoxy groups, an aroyl group, a lower alkenyl group, a sulfamoyl group, or a heterocyclic residue which may have a substituent selected from the group consisting of a hydroxyl group, methyl group, and alkylthio group; and wherein (Ce) and (Pe) represent a cephalosporin nucleus and a penicillin nucleus, respectively.

4,414,154

DIBENZO[a,d]CYCLOOCTEN-5,12-IMINES

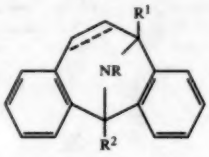
Paul S. Anderson, Lansdale; Marcia E. Christy, Perkasie; Ben E. Evans, Lansdale, and David C. Remy, North Wales, all of Pa., assignors to Merck & Co. Inc., Rahway, N.J.

Division of Ser. No. 80,896, Oct. 1, 1979, Pat. No. 4,329,465, which is a continuation-in-part of Ser. No. 917,044, Jun. 19, 1978, abandoned, which is a continuation-in-part of Ser. No. 834,343, Sep. 19, 1977, abandoned. This application Oct. 22, 1981, Ser. No. 313,913

Int. Cl.³ C07D *225/08*

U.S. Cl. 260—245.7 **5 Claims**

1. A compound of structural formula:



or a pharmaceutically acceptable salt thereof, wherein,

R is

(1) hydrogen,
(2) C_{1-3} alkyl,
(3) C_{2-3} alkenyl,
(4) phenyl-C_{1-3} alkyl,
(5) C_{3-6} cycloalkyl,
(6) C_{3-6} cycloalkyl-C_{1-3} alkyl, or
(7) dimethylaminopropyl;

R^1 is

(1) hydrogen,
(2) C_{1-3} alkyl,
(3) C_{2-3} alkenyl,
(4) phenyl-C_{1-3} alkyl, or
(5) C_{3-6} cycloalkyl;

R^2 is

(1) hydrogen,
(2) C_{1-3} alkyl,
(3) C_{2-3} alkenyl,
(4) phenyl-C_{1-3} alkyl,
(5) C_{1-3} alkoxy, or
(6) dimethylaminopropyl; and

the dotted line is a single or double bond.

4,414,155

SYNTHESIS OF THIENAMYCIN VIA ESTERS OF (3SR, 4RS)-3-[(SR)-1-HYDROXYETHYL]-β,2-DIOXO-4-AZETIDINEBUTANOIC ACID

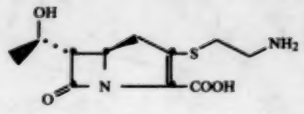
Thomas M. H. Liu, Westfield; David G. Melillo, Scotch Plains; Kenneth M. Ryan, Clark; Ichiro Shinkai, Westfield, and Meyer Sletzinger, North Plainfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 236,418, Feb. 20, 1981, abandoned, which is a division of Ser. No. 112,022, Jan. 14, 1980, Pat. No. 4,282,148. This application Mar. 29, 1982, Ser. No. 363,339

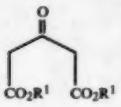
Int. Cl.³ C07D *487/04*

U.S. Cl. 260—245.2 T **2 Claims**

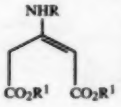
1. A process for preparing:



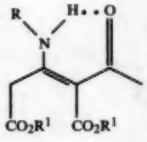
and its pharmaceutically acceptable salts and lower alkyl, aryl and aralkyl esters which comprises the steps of: treating:



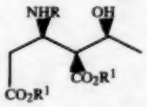
with NH_2R to form:



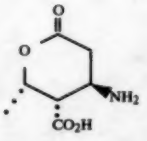
followed by acetylating to form:



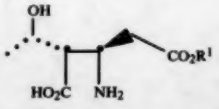
followed by reducing to form:



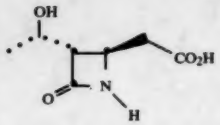
followed by cyclizing and deblocking to form:



followed by alcoholysis with R^1OH to form:



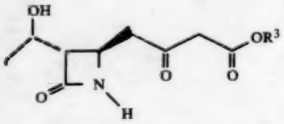
followed by cyclizing and deblocking to form:



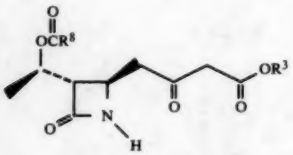
followed by treating with

$(R^3O_2CCH_2CO_2)_2Mg$

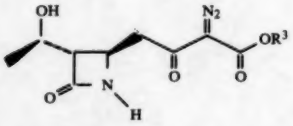
to form:



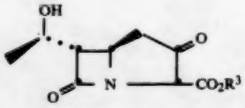
followed by reacting with a carboxylic acid R^8COOH in the presence of a triorganophosphine and an activating agent therefor to yield:



followed by deacylating and diazotization to provide:



followed by cyclizing to form:



followed by activating, treating with $HSCH_2CH_2NHR^4$, and deprotecting wherein R^1, R, R^3 and

are removable protecting groups.

4,414,156

PROCESS FOR PRODUCING 2-METHOXYBENZANTHRONES

Walter Scherrer, Basel, and Robert Portmann, Pratteln, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

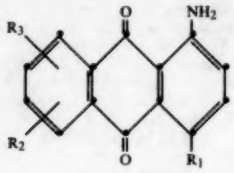
Filed Oct. 9, 1981, Ser. No. 310,577

Claims priority, application Switzerland, Oct. 29, 1980, 8048/80

Int. Cl.³ C07C *50/22*

U.S. Cl. 260—352 **11 Claims**

1. A process for producing a 2-methoxybenzanthrone, starting with 1-aminoanthraquinone of the formula I



(I)

or the corresponding anthraquinone-1-diazonium salt, wherein R_1, R_2 and R_3 independently of one another are each hydrogen or chlorine, or the hydroxyl, methoxy or benzamido group, in which process the starting compound is reacted to give the anthraquinone-1-diazonium salt, this in its turn is reacted in a Meerwein reaction with a propene derivative of the formula

wherein Z is an electron-attracting substituent, and the reaction product is then cyclised in an alkaline reaction mixture to obtain 2-hydroxybenzanthrone, the hydroxyl group of which is methylated, by reaction with the reaction medium, to yield 2-methoxybenzanthrone, the said process being characterised in that it is performed, without isolation of the intermediates, in a dimethylalkanephosphonate, of which the alkane radical has 1–4 C atoms.

4,414,157

PROCESS FOR THE PURIFICATION OF CRUDE GLYCERIDE OIL COMPOSITIONS

Akio Iwama, and Yoshitaka Kazuse, both of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 30, 1981, Ser. No. 335,493

Claims priority, application Japan, Dec. 30, 1980, 55-186985

Int. Cl.³ C09F *5/10*; C11B *3/00*

U.S. Cl. 260—428.5 **12 Claims**

1. A process for the purification of a crude glyceride oil composition which comprises diluting the crude glyceride oil composition containing a glyceride oil and phospholipid with an organic solvent, bringing the diluted crude glyceride oil composition under pressure into contact with an internal pressure capillary semipermeable membrane having an inner diameter of 0.1 to 2 mm to separate it into a semipermeable membrane permeable liquid and a semipermeable membrane impermeable liquid, bringing the thus-concentrated semipermeable membrane impermeable liquid under pressure into contact with an internal pressure type tubular semipermeable membrane having an inner diameter which is greater than that of the above capillary semipermeable membrane and which is 20 mm or less to separate it into a semipermeable membrane permeable liquid and a semipermeable membrane impermeable liquid, and removing the organic solvent from at least one of the total semipermeable membrane permeable liquid and the semipermeable membrane impermeable liquid to obtain a purified glyceride oil and/or a purified phospholipid.

4,414,158
PHOSPHONOMETHYLGLYCYLHYDROXAMIC ACID AND NOVEL HERBICIDALLY ACTIVE SALTS THEREOF

Rudolph C. Thummel, Courgenay; Hanspeter Fischer, Bottmingen, and Ludwig Maier, Arlesheim, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

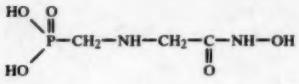
Filed Apr. 20, 1981, Ser. No. 255,411

Claims priority, application Switzerland, Apr. 29, 1980, 3302/80

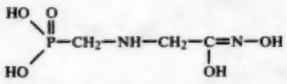
Int. Cl.³ C07F *1/08, 9/38*

U.S. Cl. 260—438.1 **8 Claims**

1. An N-phosphonomethylglycylhydroxamic acid of the formula



and/or the tautomeric formula



in the form of the free acid, the mono-, di- or trisodium salt, the copper salt, the isopropylammonium salt, the tetrabutylammonium salt, the 4-pyrrolidinium-pyridinium salt, the 1-methyl-4,4'-bipyridinium salt, the dimethylbenzylammonium salt, the dimethyldodecylammonium salt, or of a hydrohalide.

4,414,159
VINYL ETHER MONOMERS AND POLYMERS THEREFROM

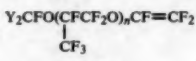
Paul R. Resnick, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Division of Ser. No. 191,301, Sep. 26, 1980, Pat. No. 4,334,082. This application Dec. 14, 1981, Ser. No. 330,332

Int. Cl.³ C07C *121/130*

U.S. Cl. 260—465.6 **9 Claims**

1. A vinyl ether monomer of the formula:



wherein Y is selected from the group consisting of CF_2CN, of CF_2CO_2R, CF_2CO_2H, CF_2CO_2M, CF_2CONH_2 and CF_2CONR_2; R is CH_3 or C_2H_5; n is an integer from 0 to 10; M is an alkali metal, ammonium or quaternary ammonium group.

4,414,160
PROCESS FOR MAKING CARBOXYLIC ACID HALIDES

Heinz Erpenbach, Cologne; Klaus Gehrmann; Winfried Lork, both of Erftstadt, and Peter Prinz, Hürth, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 14, 1981, Ser. No. 301,984

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1980, 3035201

Int. Cl.³ C07C *51/58*

U.S. Cl. 260—544 A **5 Claims**

1. In a process for making carboxylic acid halides by reacting an alkyl halide having from 1 to 6 carbon atoms or an aryl halide with carbon monoxide under practically anhydrous conditions at temperatures of 350 to 575 K. and under pressures of 1 to 300 bars in the presence of a catalyst system containing at least one of the noble metals selected from rhodium, palladium, iridium or their compounds, iodine and/or its compounds, methyl trialkyl phosphonium iodide and/or methyl triaryl phosphonium iodide, the improvement which comprises admixing the reaction mixture with 0.02 to 0.75 mol of hydrogen per mol of carbon monoxide.

4,414,161
PROCESS FOR PRODUCING LOW TEMPERATURE STABLE TERT-BUTYLPHENYL DIPHENYL PHOSPHATE

Silvio L. Giolito, Whitestone, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jul. 1, 1981, Ser. No. 279,389

Int. Cl.³ C07F *9/09*

U.S. Cl. 260—975 **13 Claims**

1. A process of producing tert-butylphenyl diphenyl phosphate characterized by low temperature stability comprising the steps of: (a) alkylating a phenol with isobutylene to produce a predominately para-tert-butylphenol having a C_4/ϕ ratio of from about 0.70 to 0.90 and (b) catalytically isomerizing the para-tert-butylphenol to produce a meta/para isomerized tert-butylphenol mixture having a meta/para ratio of from about 0.50 to about 0.70; then (c)realkylating the isomerized tert-butylphenol mixture at a temperature of from about 120° C. to about 190° C. to obtain a C_4/ϕ ratio of from about 0.55 to about 0.85 and a meta/para ratio of from about 0.25 to about 0.50; and (d) phosphorylating the realkylated tert-butylphenol with a phosphorylating agent to produce a tert-btuylphenyl diphenyl product characterized by a SUS viscosity of about 550 and low temperature stability.

4,414,162
AIR VALVE TYPE TWIN COMPOUND CARBURETOR FOR ENGINES

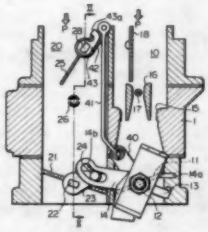
Akira Ii; Mitunori Sasano; Michio Morishita, all of Toyota; Mikio Kuno, Aichi, and Kunio Kadowaki, Obu, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Aisan Industry Co., Ltd., Obu, both of, Japan

Filed Feb. 8, 1982, Ser. No. 346,992

Claims priority, application Japan, Oct. 30, 1981, 56-172947

Int. Cl.³ F02M *13/04*

U.S. Cl. 261—23 A **3 Claims**



1. An air-valve type two-stage twin compound carburetor for an internal combustion engine, comprising:

a carburetor body including a primary bore and a secondary bore;

a primary throttle valve which is arranged in the primary bore so that it can be opened and closed;

a secondary throttle valve which is arranged in the secondary bore so that it can be opened and closed cooperatively with the opening and closing of said primary throttle valve, after said primary throttle valve has been opened beyond a certain degree;

an air valve which is arranged in the secondary bore upstream of a secondary fuel nozzle disposed upstream of said secondary throttle valve so that said air valve can be opened and closed; and

means for regulating the opening degree of said air valve,

wherein said means comprises a first lever rotatably mounted on an air valve shaft to which said air valve is fixed, a second lever, capable of abutting on said first lever, being secured to said air valve shaft, a third lever fixed to a primary throttle shaft to which said primary throttle valve is fixed, and a connecting rod pivotally connected at one thereof to a free end of said third lever, and the other end of said connecting rod being pivotally connected to a free end of said first lever, so that the first lever is caused to abut on the second lever so as to open said air valve beyond a predetermined opening degree thereof, when said primary throttle valve is closed at a position close to the idling position thereof.

4,414,163

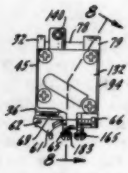
FUEL FEED AND CHARGE FORMING APPARATUS

Rodney E. Barr, Cary, N.C., and Daniel L. Donovan, Decatur, Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed May 17, 1982, Ser. No. 378,584

Int. Cl.³ F02M *17/04*

U.S. Cl. 261—69 A **19 Claims**



1. A carburetor for an internal combustion engine including, in combination, a substantially cubically shaped body provided with a mixing passage having an air inlet region extending from a first planar surface and a mixture outlet region terminating at a second planar surface which serves for mounting the carburetor on the engine, a fuel chamber in the body, a flexible diaphragm forming a wall of the chamber, a fuel inlet passage in the body, a valve for the fuel inlet passage, control means for said fuel inlet valve including a lever actuated by movement of said diaphragm under the influence of reduced pressure in the mixing passage, a main orifice opening into the mixing passage, a throttle valve in the mixture outlet region of the mixing passage, an engine idling orifice opening into the mixing passage at the downstream side of the throttle valve, fuel channel means in said body for conveying liquid fuel from the fuel chamber to the orifices, a first pair of bosses, one extending transversely from each side of the body adjacent the air inlet region, a second pair of bosses, one boss of said second pair extending transversely from each side of the body adjacent the mixture outlet region, each boss of the second pair being in parallel alignment with a boss of the first pair, each of the bosses having a bore, the bores of the aligned pair of bosses being in spatial alignment, a pair of hollow cylindrical metal support members, one extending between each pair of spatially aligned boss bores and secured therebetween such that the ends of said support members extend only to the first and second planar surfaces, wherein said hollow cylindrical metal support members can receive a mounting bolt through its hollow center portion, thereby providing both a heat sink for cooling said carburetor and a load bearing member substantially impervious to thermal and mechanical creep, and to mechanical compression from bolt torque.

4,414,164

PROCESS AND APPARATUS FOR PRODUCING PREFORMS FOR OPTICAL FIBERS

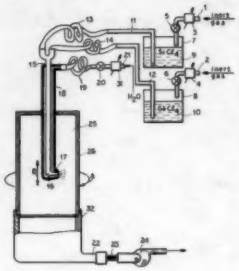
Giacomo Roba, Cogoleto, and Paolo Vergnano, Chieri, both of Italy, assignors to Caselt - Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Sep. 9, 1980, Ser. No. 185,514

Claims priority, application Italy, Sep. 10, 1979, 68789 A/79

Int. Cl.³ B05B *13/02*

U.S. Cl. 264—1.2 **5 Claims**



1. In a process for making a preform from which an optical fiber can be drawn, including the steps of (a) reacting a silicon halide with an oxidant in the presence of a doping agent, (b) depositing the resulting vitrifiable material on a cylindrical supporting surface to form a porous tubular structure having a selected refractive-index profile, (c) collapsing said tubular structure at high temperature into a solid rod, and (d) thermally vitrifying said rod,

the improvement wherein steps (a) and (b) are performed substantially at room temperature with said silicon halide and said doping agent present in liquid form, the two liquids being intermixed and jointly conducted to a spray nozzle confronting said supporting surface and being admixed in said spray nozzle with said oxidant for entrainment in a single spray onto said supporting surface in step (b) with relative rotation and axial reciprocation of the spray and said supporting surface to coat the latter in a multiplicity of helicoidal passes while progressively varying the relative feed rates of said liquids during at least some of said passes in accordance with the selected refractive-index profile.

4,414,165

METHOD AND DEVICE FOR PRODUCING AN OPTICAL TRANSMISSION ELEMENT

Ulrich Oestreich; Gernot Schoeber, both of Munich, and Gerd Witt, Neuried, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Mar. 12, 1982, Ser. No. 357,699

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1981, 3111693

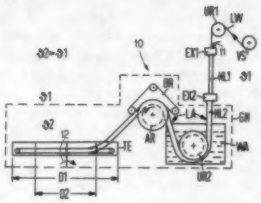
Int. Cl.³ B29D *11/00*

U.S. Cl. 264—1.5 **22 Claims**

1. A method for manufacturing an optical transmission element comprising a fiber-shaped optical waveguide loosely received in a tubular jacket of a greater internal diameter and containing a filling material so that the waveguide is freely moveable in the jacket to a certain extent, said method comprising providing the waveguide and means for forming a jacket at an elevated temperature, forming a vertically extending jacket by said means, simultaneously introducing the filling material and waveguide into the vertically extending jacket as it is being formed, cooling the formed jacket to a lower second temperature, coiling the jacket into a coil arrangement during

a portion of said step of cooling, said step of coiling including maintaining the waveguide on the smallest radius of curvature of the coiled tubular jacket by retarding the rate of introduction of the waveguide into the jacket at said means for forming said jacket, and subsequently cooling the coiled arrangement from the second temperature to the ambient temperature with the shrinkage of the jacket occurring during said second cooling step and the amount of retarding of the waveguide producing the desired relationship between the length of the jacket and the length of the waveguide therein.

18. A device for producing an optical transmission element having a fiber shaped optical waveguide loosely received in a tubular jacket containing a filling material and having an interior diameter greater than the diameter of the waveguide so



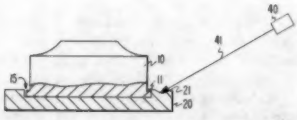
that the waveguide can freely move within the jacket to a limited extent, said device comprising means for forming a tubular jacket at an elevated temperature and extending in a vertical direction, means for introducing a waveguide into the tubular jacket as it is being formed, said means for introducing including a supply reel for the waveguide and means for retarding the rate of introduction of the waveguide into the tubular jacket; housing means for enclosing the tubular jacket after it is formed, said housing means being at a second temperature lower than the elevated temperature and above the ambient temperature, said housing means containing a trough of cooling medium for rapidly cooling the tubular jacket to said second temperature; and means for coiling the jacket into a coiled arrangement being disposed in said housing means.

4,414,166

LASER JOINING OF THERMOPLASTIC AND THERMOSETTING MATERIALS

Paul M. Charlson, Longmont, Colo.; Clarence R. Schwieters, and Jun H. Souk, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 4, 1982, Ser. No. 336,650
Int. Cl.³ B29C *23/00, 27/00, 9/00*
U.S. Cl. 264—25 **6 Claims**



1. A method for joining thermoplastic material to thermosetting material comprising the steps of:

forming a projection locking surface on the thermosetting material,

causing the termoplastic material to melt and flow merely by projecting a laser beam to impinge upon the thermoplastic material at the area adjacent to said locking surface,

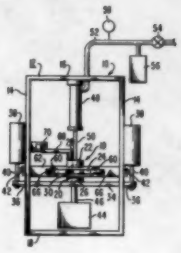
the melted material flowing out of its own plane over said locking surface to form a joint at the interface between the thermosetting and thermoplastic materials.

4,414,167

METHOD FOR MOLDING AN ARTICLE

John J. Prusak, and Bhupendra P. Patel, both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 18, 1982, Ser. No. 350,087
Int. Cl.³ B29F *1/06*
U.S. Cl. 264—40.5 **2 Claims**



1. A method of molding an article in a mold which includes at least two mold members having opposed recesses which are adapted to mate to form a mold cavity, a pneumatic cylinder for moving the mold members toward each other to a collapsed position in which the mold cavity is of a volume less than the desired volume of the article and away from each other to an expanded position in which the mold cavity is of the desired volume of the article, a pipe connecting the pneumatic cylinder to a source of air under pressure, valve means connected to said pipe for allowing air to flow from the source to the pneumatic cylinder but preventing the flow of air from the pneumatic cylinder to the source, and an enclosed air reservoir connected to the pipe between the pbneumatic cylinder and the valve means, said method comprising

injecting a plastic mold material into the mold cavity with said mold cavity being in the collapsed position until the cavity is filled with said material,

continuing to inject additional mold material into the cavity so that the mold material moves the mold members apart to the expanded position of the mold member against the pressure of the pneumatic cylinder which applies pressure on the mold material, and

maintaining substantially uniform pressure on the mold material in the cavity while the mold members are being moved from the collapsed position to the expanded position solely by allowing the air in the pneumatic cylinder to expand into the enclosed air reservoir.

4,414,168

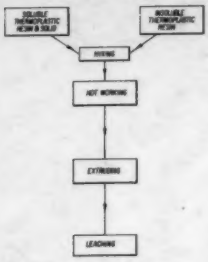
PROCESS FOR MANUFACTURING A POROUS DIP TUBE

Thomas E. Hankin, Morrisville, Pa., assignor to ESB Incorporated, Philadelphia, Pa.

Filed Nov. 24, 1980, Ser. No. 209,515
Int. Cl.³ B29D *27/00*
U.S. Cl. 264—49 **2 Claims**

1. A process for manufacturing a porous dip tube adapted to carry a first liquid longitudinally from an entry open end thereof to a discharge valve at the other end thereof under pressure derived from a second liquid floating on said first liquid and to permit transportation of a component of said second liquid laterally through the wall thereof comprising forming a hot-worked and plasticized viscous mass of a first polymer insoluble in said first and second liquids, a second polymer soluble in a solvent, said solvent being a non-solvent for said first polymer and fine particles of a solid, non-fusible at the hot-working temperature and said solid being soluble in said solvent, extruding said mass to tube form and thereafter

dissolving said soluble polymer and said solid in said solvent to thereby provide in the wall of said tube pores having an aver-



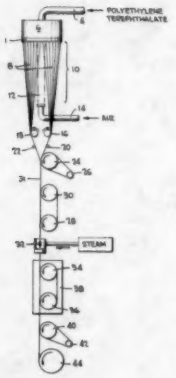
age cross-sectional dimension of about 1 to about 10 micrometers.

4,414,169

PRODUCTION OF POLYESTER FILAMENTS OF HIGH STRENGTH POSSESSING AN UNUSUALLY STABLE INTERNAL STRUCTURE EMPLOYING IMPROVED PROCESSING CONDITIONS

Edward B. McClary, Charlotte, N.C., assignor to Fiber Industries, Inc., Charlotte, N.C.

Filed Feb. 26, 1979, Ser. No. 15,512
Int. Cl.[3] D01D *5/12*
U.S. Cl. 264—210.7 **21 Claims**



1. In a process for the production of improved polyester filaments of high strength having an unusually stable internal structure which particularly are suited for use at elevated temperatures, comprising:

(a) extruding a molten melt-spinnable polyester which contains 85 to 100 mol percent polyethylene terephthalate and 0 to 15 mol percent of copolymerized ester units other than polyethylene terephthalate having an intrinsic viscosity of 0.5 to 2.0 deciliters per gram through a shaped extrusion orifice having a plurality of openings to form a molten filamentary material,

(b) passing the resulting molten filamentary material in the direction of its length through a solidification zone having an entrance end and an exit end wherein said molten filamentary material is uniformly quenched and transformed into a solid filamentary material,

(c) withdrawing said solid filamentary material from said solidification zone while under a substantial stress of 0.015 to 0.150 gram per denier measured immediately below the exit end of said solidification zone,

(d) continuously conveying said resulting as-spun filamentary material from the exit end of said solidification zone to a stress isolation device at a rate in excess of 500 meters per minute up to 3000 meters per minute with said filamentary material as it enters said stress isolation device exhibiting a relatively high birefringence of $+9\times10^{-3}$ to $+70\times10^{-3}$,

(e) continuously conveying said resulting filamentary material from said stress isolation device to a first draw zone,

(f) continuously drawing said resulting filamentary material at a draw ratio of 1.01:1 to 3.0:1 while present in said first draw zone, and

(g) subsequently thermally treating said previously drawn filamentary material while under a longitudinal tension and present at a temperature above that of said first draw zone to achieve at least 85 percent of the maximum draw ratio of said as-spun filamentary material and impart a tenacity of at least 7.5 grams per denier to the same, with at least the final portion of said thermal treatment being conducted at a temperature within the range from about 90° C. below the differential scanning calorimeter peak melting temperature of the same up to below the temperature of which filament coalescence occurs;

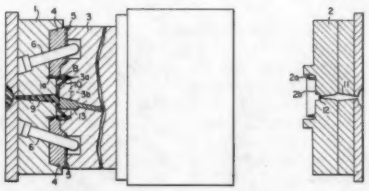
the improvement comprising providing said first draw zone in which step (f) is carried out, throughout at a temperature below the glass transition temperature of said as-spun filamentary material thereby facilitating a savings of energy when compared with polyethylene terephthalate drawing procedures of the prior art, and concomitantly enabling said drawing step (f) to be carried out in combination with the other process steps on a stable basis in the substantial absence of filament neck drawing.

4,414,170

METHOD OF PRODUCING VENTILATOR GRILLS

Yoshiaki Sano, Fuji, Japan, assignor to Nihon Plast Co., Ltd., Fuji and Yamato Plastics Machinery Co., Ltd., Tokyo, both of, Japan

Filed Apr. 6, 1982, Ser. No. 365,918
Int. Cl.[3] B29D *3/00*; B29F *1/00*
U.S. Cl. 264—242 **2 Claims**



1. A method of producing a ventilator grill of the type which comprises a grill frame and substantially parallel louver vanes pivotally mounted on said grill frame, said grill frame including a pair of opposite sides in which aligned pairs of axle holes are formed, said louver vanes having axles extending from the opposite ends of said vanes respectively and rotatably received in respective aligned pairs of axle holes, said grill frame being provided with at least two recesses formed in the outer surfaces of said pair of opposite sides of said frame and communicated with one of said aligned pairs of axle holes, the louver vane associated with said one aligend pair of axle holes having disc-like friction portions integrally connected to the outer ends of the axles of said one vane and received in said recesses rotatably but frictionally to provide a slight frictional resistance to angular movements of said louver vane relative to said grill frame, said method comprising the steps of:

gathering together first and second mould halves and cores

in a first predetermined position in which they cooperate to define a first mould cavity for moulding said grill frame, said cores defining surfaces for moulding said axle holes and said recesses;

injecting a first plastics material into said first mould cavity;

allowing said first plastics material to solidify in said first mould cavity to form said grill frame having axle holes and recesses;

removing said grill frame from said first mould half and from said cores while said grill frame is retained on said second mould half;

gathering together said second mould half with said grill frame thereon and a third mould half in a second predetermined position in which the part of said grill frame moulded by said first mould half is received in said third mould half and in which said second and third mould halves and said grill frame cooperate to define a second mould cavity for moulding said louver vanes, said second mould cavity including spaces for moulding said axles and friction portions, said spaces being defined by said axle holes and recesses formed in said grill frame;

injecting into said second mould cavity a second plastics material which is not weldable to said first plastics material and has a melting point lower than that of said first plastics material; and

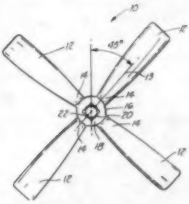
allowing said second plastics material to solidify in said second mould cavity to form said vanes, said axles and disk-like friction portions of said vanes being shrunk when solidified in said axle holes and recesses to allow said vanes to be angularly movable relative to said grill frame.

4,414,171

METHOD OF MAKING AN INJECTION MOLDED PROPELLER

Brian J. Duffy, Derby; Eugene J. Gratz, Wichita; Steven E. Potter, Conway Springs, and Royal A. Power, Wichita, all of Kans., assignors to The Boeing Co., Seattle, Wash.

Filed Jan. 28, 1982, Ser. No. 343,536
Int. Cl.³ B29C *27/00*; B29D *3/00*
U.S. Cl. 264—249 **4 Claims**



1. A method of attaching a propeller having a hub with a bore therethrough, the hub having a plurality of grooves spaced around the inner circumference of the hub and propeller blades extending outwardly from the outer circumference of the hub, the steps comprising:

injection molding the propeller using a thermoplastic material in a mold die;

forming grooves spaced around the circumference of the hub offset from the center line of the blade in the mold die;

removing the propeller from the mold die;

fitting a drive shaft into the propeller hub, the drive shaft having ribs disposed around the circumference of the shaft, the ribs indexed with the grooves in the hub when the shaft is inserted therein; and

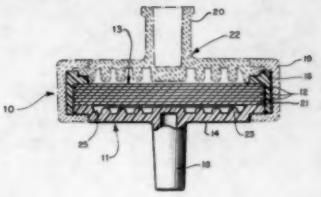
cooling the propeller hub on the drive shaft thereby providing a shrink fit and forming a high pressure bond therebetween, the grooves having a depth greater than the height of the ribs so that upon shrinking a space is left between the end of the ribs and the grooves.

4,414,172

PROCESS AND APPARATUS FOR SEALING A PLURALITY OF FILTER ELEMENTS

Hayden L. Leason, Palmas Del Mar, P.R., assignor to Filtertek, Inc., Hebron, Ill.

Filed May 21, 1982, Ser. No. 380,565
Int. Cl.³ B29C *6/04, 5/00*; B29D *31/00*
U.S. Cl. 264—255 **14 Claims**



1. A method for sealing a plurality of filter elements to a thermoplastic support having at least one aperture for the passage of a fluid, comprising the steps of:

supporting the thermoplastic support on a lower mold half;

aligning a plurality of filter elements over the aperture and the adjacent surface portions of the support, by utilizing a retractable locater projecting from the lower mold half;

placing an upper mold half over the lower mold half, the upper mold half having portions which contact and apply pressure to the filter elements between the periphery of the filter elements and the portion of the elements above the aperture to hold the filter elements in position on the support, the upper mold half having portions which engage the retractable locater causing it to retract into said lower mold half as the upper mold half contacts the filter elements leaving an injection channel adjacent said elements;

injection molding a thermoplastic material in said channel being formed by the upper mold half, the lower mold half, and the retractable locater, to form an integral seal between the support and the filter elements; and

separating the mold halves and ejecting the support and its integral filter element.

4,414,173

IN-MOLD COATING

David S. Cobbledick, Kent; Donald F. Reichenbach, Massillon, and Henry Shanoski, Akron, all of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 316,592, Nov. 2, 1981, abandoned. This application Oct. 25, 1982, Ser. No. 435,026
Int. Cl.³ B29H *9/02*; C08L *75/00*
U.S. Cl. 264—257 **5 Claims**

1. A method which comprises in-mold coating a molded thermoset polyester resin or thermoset vinyl ester resin glass fiber composition containing from about 10 to 75% by weight of glass fibers with a thermosetting in-mold coating composition under pressure, at a temperature and for a period of time sufficient to cure said in-mold coating composition to form an adherent thermoset coating on said molded thermoset resin glass fiber composition, said in-mold coating composition comprising

(a) 100 parts by weight of at least one polymerizable epoxy based oligomer having at least two acrylate groups and a weight average molecular weight of from about 500 to 1,500,

(b) from about 80 to 160 parts by weight of at least one copolymerizable ethylenically unsaturated monomer,

(c) from about 10 to 120 parts by weight of at least one copolymerizable monoethylenically unsaturated compound having a —CO— group and a —NH_2, —NH— and/or —OH group,

(d) from about 20 to 90 parts by weight of polyvinyl acetate,

(e) from about 0.2 to 5 parts by weight of at least one zinc salt of a fatty acid having at least 10 carbon atoms,
(f) from about 0.01 to 1.0 part by weight of at least one accelerator for a peroxide inhibitor,
(g) from about 5 to 30 parts by weight of conductive carbon black,
(h) from about 50 to 155 parts by weight of a filler,
(i) from about 5 to 120 parts by weight of a copolymerizable or cocurable diacrylate compound having a weight average molecular weight of from about 250 to 5,000 and being selected from the group consisting of
(I) at least one polyoxyalkylene glycol oligomer having two acrylate groups and
(II) at least one polyurethane oligomer having two acrylate groups and mixtures of (I) and (II) and

at least one organic free radical peroxide initiator in an amount of up to about 5% by weight based on the weight of the polymerizable ethylenically unsaturated materials.

4,414,174

REACTION INJECTION MOLDING COMPOSITIONS AND PROCESS

Daniel Klempner, Farmington Hills, and Kurt C. Frisch, Grosse Ile, both of Mich., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 29, 1982, Ser. No. 372,897
Int. Cl.³ B29B *1/24*; B29F *1/00*; C08G *18/38*
U.S. Cl. 264—328.6 **6 Claims**

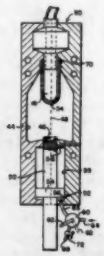
1. A reaction injection molding composition comprising a polyisocyanate, a polymeric polyol, a short chain diol and a hydroxyalkylmelamine, the total hydroxyl content of the polymeric polyol, the short chain diol and the hydroxyalkylmelamine, being about equal to the stoichiometric requirements of said isocyanate, up to an isocyanate index of about 300, the polymeric polyol comprising the major weight proportion of the combination of polymeric polyol, short chain diol and hydroxyalkylmelamine and said hydroxyalkylmelamine comprising from about one fifth to about twice the weight content of short chain diol.

4,414,175

METHOD FOR BLOWING ORIENTED CONTAINERS

Dewey Rainville, Westfield, N.J., assignor to Rainville Co., Inc., Middlesex, N.J.

Division of Ser. No. 194,853, Oct. 7, 1980, Pat. No. 4,364,721, which is a continuation of Ser. No. 30,813, Apr. 17, 1979, abandoned. This application Mar. 22, 1982, Ser. No. 360,427
Int. Cl.³ B29C *17/07*
U.S. Cl. 264—531 **4 Claims**



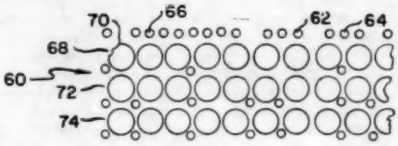
1. The method of making injection blow-molded plastic containers including applying a molten plastic parison to a core rod in an injection mold, moving the core rod with the plastic thereon from the injection mold to a blowing mold with the parison at a higher temperature than the orientation temperature of the plastic of the parison, the parison being held at the blowing end of the blowing mold and in axial offset from the opposite end of the blowing mold, providing at said opposite end a reciprocating element with a container-bottom-defining surface having a localized parison-piercing formation, advancing said reciprocating element in substantially axial alignment with the core rod and to the point of pierced and bottom-supporting contact with the parison, blowing the parison, and retracting said element during the blowing while maintaining said pierced and bottom-supporting support, thereby holding the parison centered in the course of parison-expansion.

4,414,176

FIRST WALL AND LIMITER SURFACES FOR PLASMA DEVICES

Alan R. Krauss, Plainfield, and Dieter M. Gruen, Downers Grove, both of Ill., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Jun. 1, 1981, Ser. No. 269,235
Int. Cl.³ G21B *1/00*
U.S. Cl. 376—136 **22 Claims**



1. In a plasma device, a metallic member exhibiting reduced erosion when exposed to plasma at an elevated temperature, the member comprising: a metallic substrate composed of a first metal and a protective thin surface layer on the substrate, the surface layer comprising at least about 90 atomic percent of a second metal selected from the group consisting of alkali and alkaline earth metals, the first metal being more electronegative than the second metal, the surface layer being characterized by atoms of the second metal having ionic bonds to atoms of the first metal in the substrate and forming a higher ratio of secondary ions to neutrals than atoms of the second metal in bulk form when exposed to said plasma, and the binding energy between atoms of the first and second metal being below the binding energy between like atoms of the first metal and above the binding energy between like atoms of the second metal.

4,414,177

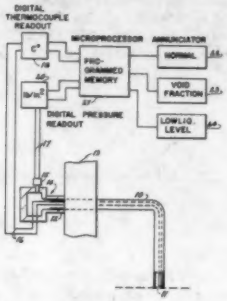
LIQUID LEVEL, VOID FRACTION, AND SUPERHEATED STEAM SENSOR FOR NUCLEAR REACTOR CORES

Richard D. Tokarz, West Richland, Wash., assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Oct. 27, 1981, Ser. No. 315,379
Int. Cl.³ G21C *17/00*
U.S. Cl. 376—247 **5 Claims**

1. A phase monitoring apparatus for coolant within a pressurized nuclear reactor vessel, comprising:
a length of small diameter tubing having an open end within the vessel at a preselected location, said length of tubing being extended to the exterior of the vessel;
temperature sensing means positioned at the open end of the length of tubing for measuring the temperature of coolant at said preselected location;
pressure sensing means exterior of the vessel and operably connected to the interior of the length of tubing for measuring the pressure of coolant at said preselected location;
and means operably connected to said pressure sensing means and to said temperature sensing means for comparing the

measured temperature to the known saturated temperature of the coolant at the pressure measured by said pressure



sensing means, whereby the phase condition of coolant at said preselected location can be determined.

4,414,178

NICKEL-PALLADIUM-CHROMIUM-BORON BRAZING ALLOY

Murray S. Smith, Jr., Cincinnati; Mark S. Hilboldt, Fairfield, and Pracheeshwar S. Mathur, Montgomery, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Oct. 9, 1981, Ser. No. 310,339
Int. Cl.³ C22C *19/04*
U.S. Cl. 422—444 **5 Claims**

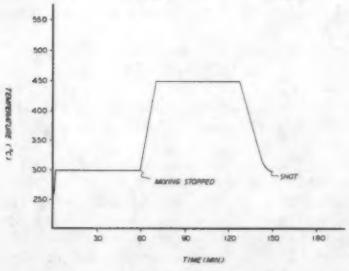
1. An improved brazing alloy consisting essentially of, by weight, about 28–32% Pd, about 6–13% Cr, about 1–3.5% B, balance being Ni and incidental impurities, the alloy further characterized by the substantial absence of Si and having a brazing temperature in the range of about 1800° F.–2000° F.

4,414,179

PROCESS FOR MAKING PHOTORECEPTORS

Susan L. Robinette, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 3, 1981, Ser. No. 326,997
Int. Cl.³ C22C *1/02, 28/00*
U.S. Cl. 420—579 **10 Claims**



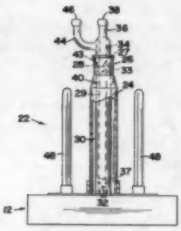
1. A process for preparing a photoconductive insulating alloy comprising selenium, about 0.3 percent by weight to about 0.5 percent by weight arsenic, based on the total weight of said alloy, and about 50 ppm to about 150 ppm chlorine, based on the total weight of said alloy comprising heating a mixture comprising sufficient selenium, arsenic and chlorine to a temperature between about 290° C. and about 330° C. to form a molten mixture, agitating said molten mixture to blend said selenium, arsenic and chlorine, discontinuing or substantially discontinuing all agitation of said molten mixture, heating said molten mixture to a temperature of at least about 420° C. for at least about 30 minutes, and cooling said mixture until it becomes a solid.

4,414,180

METHOD FOR GENERATING CHLORINE DIOXIDE GAS

Robert P. Fisher, 4909 NW. 17th Pl., Gainesville, Fla. 32605

Filed Oct. 13, 1981, Ser. No. 310,459
Int. Cl.³ B01J *19/12*
U.S. Cl. 422—186 **4 Claims**



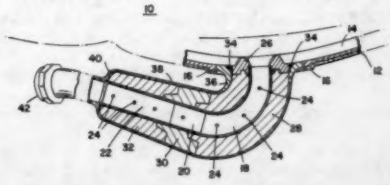
1. A chlorine dioxide generator for generating chlorine dioxide gas from a chlorite through the use of photochemical oxidation: said chlorine dioxide generator comprising a chlorine dioxide gas generating chamber operatively supported on a base including a transparent hollow reaction tube, a gas conduit member mounted on the upper portion and partially disposed within said transparent hollow reaction tube, a light source disposed adjacent said chlorine dioxide gas generating chamber and an opaque shield having a plurality of apertures formed in the lower portion thereof, disposed within said reaction tube, said gas conduit member including an innermost gas supply portion and an inner chlorine dioxide gas discharge portion, bounded externally by the opaque shield, wherein said light source radiates said chlorine dioxide gas generating chamber to photochemically oxidize the chlorite to produce chlorine dioxide in the aqueous phase which is swept into a gas phase by said innermost gas supply portion and discharged through said inner chlorine dioxide gas discharge portion.

4,414,181

GAS GENERATOR OUTLET HAVING CONTROLLED TEMPERATURE TRANSITION

Edward J. Ford, Jr., Cupertino, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 2, 1981, Ser. No. 317,712
Int. Cl.³ B01J *19/02*
U.S. Cl. 422—240 **2 Claims**



1. A combustion generator outlet for conducting high temperature gas from a gas generator to a manifold while maintaining a precise temperature gradient along both the radial and longitudinal axes of said outlet comprising:
(a) an external layer constructed of three separate metal alloys

of increasing thermal capability as said outlet is traversed from said gas generator to said manifold, said external layer constructed as a titanium elbow portion welded at one end to said gas generator to receive said gas and welded at the opposite end to one end of a reducer portion having increased thermal capability with respect to said elbow portion, said reducer portion having the opposite end welded to a tube end cup assembly having increased thermal capability with respect to said reducer;

(b) an insulation layer of silica phenolic, said insulation layer formed as a cylindrical tube of interlocking segments machined to fit receivably together end-to-end, the thickness of said insulation layer having decreasing taper between said gas generator and said manifold;

(c) an inner tubular liner of titanium-zirconium-molybdenum alloy encased by said insulation layer, said inner layer having an elbow shaped portion open at one end to receive said gas from said generator, a central portion threaded on the opposite end of said elbow portion and an end portion having one end threaded to said central portion and the opposite end welded to said tube and cup assembly of said external layer, said inner liner having a series of small regularly spaced holes along its length; and

(d) a titanium-zirconium-molybdenum alloy coupling flange swaged onto one end portion of said outlet for connecting said outlet to said manifold.

4,414,182

PROCESS FOR PRODUCING HYDROGEN

Hiroshi Okamoto, Ohme; Tetsuichi Kudo, and Go Kawamura, both of Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 2, 1982, Ser. No. 345,016
Claims priority, application Japan, Feb. 18, 1981, 56-21551
Int. Cl.³ C01B *1/18*
U.S. Cl. 423—652 **4 Claims**

1. A process for generating hydrogen from an alkaline aqueous solution of formaldehyde wherein the solution is contacted with at least one catalyst selected from the group consisting of molybdenum, tungsten, molybdenum carbides, tungsten carbides, tungsten molybdenum carbides, molybdenum nitrides, and tungsten borides to catalyze the generation of hydrogen from said solution.

4,414,183

PHENOLIC CHELATE RESIN, PROCESS FOR PRODUCING THE SAME, AND METHOD OF RECOVERING HEAVY METAL IONS WITH THE SAME

Akio Sasaki, Jyoyo, and Yoshiaki Echigo, Uji, both of Japan, assignors to Unitika Ltd., Amagasaki, Japan

Division of Ser. No. 246,770, Mar. 23, 1981. This application Jul. 20, 1982, Ser. No. 400,190
Claims priority, application Japan, Mar. 22, 1980, 55-36358
Int. Cl.³ C22B *60/02*; B01J *45/00*
U.S. Cl. 423—7 **5 Claims**

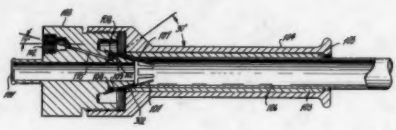
1. A method of recovering a heavy metal ion from an aqueous solution by selective adsorption, comprising the steps of: containing the solution with a phenolic chelate resin having a chelate-forming group wherein hydrogen atoms in a primary or secondary alkylamino group introduced in a phenol nucleus are replaced by a methylenephosphonate group; and allowing for the formation of a chelate.

4,414,184

APPARATUS FOR MIXING CHEMICAL COMPONENTS

Bruce H. W. Pinkston, Cleveland, Ohio, assignor to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 237,242, Feb. 23, 1981, abandoned, which is a continuation of Ser. No. 115,623, Jan. 28, 1980, abandoned. This application Mar. 24, 1982, Ser. No. 361,193
Int. Cl.³ B01F *5/06*
U.S. Cl. 422—133 **2 Claims**



1. An apparatus for producing a mixture of chemical components which comprises an elongated housing defining an elongated cylindrical tube extending therethrough, said housing having a main body portion with one end of said inlet tube extending upstream of said main body portion and forming a first inlet means for supplying at least one component into said tube whereby said components flow from said inlet means to the other end of said tube, said other end of said tube extending downstream of said main body and forming an oulet means with the outer surface thereof being conical in shape, said outer conical surface of said outlet means having an upstream annular groove therein and communicating with a plurality of longitudinal grooves extending along the length of said conical surface, second inlet means in said housing communicating with said annular groove via passage means in said housing for supplying at least one component either reactive with one or more components from said first inlet means, or catalyzing the reaction of two or more components from said first inlet means, discharge tube means connected to the downstream end of said main body, and conically shaped, directing and distributing means, located within said discharge tube means cooperating with said outer conical surface of said outlet means for directing the components from said grooves into the flow of components in said tube, said directing and distributing means extending into the flow path of said outlet means for mixing the components from said first and second inlet means.

4,414,185

PROCESS FOR CALCIUM FLUORIDE PRODUCTION FROM INDUSTRIAL WASTE WATERS

Jonas P. Harrison, Pinole, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 9, 1982, Ser. No. 406,420
Int. Cl.³ C02B *1/20*
U.S. Cl. 423—163 **7 Claims**

1. A process for the preparation of high purity calcium fluoride from industrial waste waters containing fluoride which comprises:

(a) contacting the industrial waste waters containing fluoride with aqueous potassium hydroxide to thereby obtain an aqueous solution of potassium fluoride and potassium hydroxide;

(b) contacting the solution of step (a) with finely divided high purity lime to thereby obtain a calcium fluoride precipitate in aqueous potassium hydroxide;

(c) settling the reaction product of step (b) into two phases comprising an aqueous potassium hydroxide supernatant and an aqueous slurry of calcium fluoride;

(d) recovering the aqueous potassium hydroxide supernatant;

(e) diluting the slurry of calcium fluoride with water;

(f) neutralizing the slurry of step (e) with carbon dioxide until the pH of the slurry is lowered to about 8 to 9; and

(g) filtering the slurry of step (f) to thereby provide the calcium fluoride product.

4,414,186

METHOD AND APPARATUS FOR CALCINING LIMESTONE IN A SHAFT KILN

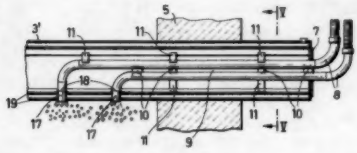
Martin Schmidt; Walter Köhler; Hans-Ulrich Loch, all of Bochum, and Albrecht Weber, Ratingen, all of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Apr. 22, 1982, Ser. No. 370,833

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1981, 3116986

Int. Cl.³ C01F *11/06*; C01B *13/14*; F27B *3/22*

U.S. Cl. 423—175 9 Claims



1. An apparatus for calcining minerals such as limestone comprising in combination:

a vertical shaft kiln with a calcining chamber therein;

a plurality of horizontally extending hollow support means being double walled for the flow of coolant between the double walls and positioned at different levels in said calcining chamber, the inside space within the support being closed in an upward direction;

fuel conduits each including a plurality of solid fuel pipes in parallel relationship extending from outside said kiln into said support means space within each of the support means;

guide means extending longitudinally within said support means and parallel thereto supporting said conduits so that the fuel pipes can be slid therealong;

spaced discharge openings from said pipes along said conduits; said conduit means being positionally adjustable along said guide means so that the location of said openings can be changed relative to the kiln with movement of said conduit means along said guide means for uniform distribution of fuel across the chamber;

means for delivering granular fuel to said conduit for a soft burning process within the kiln;

and means fo circulating coolant between the double walls of said support means.

4,414,187

PREPARATION OF METAL PHOSPHATES BY A REACTION USING BORON PHOSPHATE

Carlos E. Bamberger, Oak Ridge, Tenn., assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed May 19, 1982, Ser. No. 379,801

Int. Cl.³ C01B *25/26*

U.S. Cl. 423—251 1 Claim

1. A method of preparing metal phosphate, comprising the steps of:

preparing a mixture of boron phosphate and a first compound selected from the group consisting of AlF_3, NdF_3, La_2O_3, Nd_2O_3, Tb_7O_{12}, AmO_2, PuO_2, UO_2, NpO_2, CeO_2, Fe_2O_3, and Fe_3O_4; and

heating said mixture to form a phosphate of the metal in said first compound and a second compound selected from the group consisting of a boron oxide and a boron salt.

4,414,188

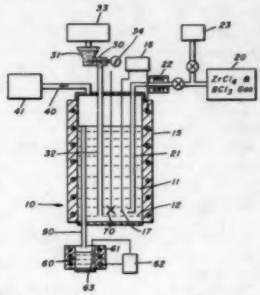
PRODUCTION OF ZIRCONIUM DIBORIDE POWDER IN A MOLTEN SALT BATH

Aaron J. Becker, Monroeville, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Apr. 23, 1982, Ser. No. 371,234

Int. Cl.³ C01B *35/04*

U.S. Cl. 423—297 9 Claims



1. A process for production of ZrB_2 powder, said process comprising the steps of

(a) providing a molten salt bath comprising $ZrCl_4$ or $ZrCl_2$ and at least one other salt selected from the group consisting of halides of K, Na, Li, Ca and Mg, and mixtures thereof;

(b) maintaining said bath at a temperature above its solidus temperature;

(c) feeding a boron halide and Al or Mg metal to the bath;

(d) reacting the $ZrCl_4$ or $ZrCl_2$ with the boron halide and Al or Mg in the bath to form ZrB_2 powder; and

(e) separating the ZrB_2 powder from the bath.

4,414,189

MODIFICATION OF CATALYTIC ACTIVITY OF SYNTHETIC ZEOLITES

George T. Kokotailo, Woodbury; Albert C. Rohrman, Jr., Gibbstown, and Stephen Sawruk, Woodbury, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 27, 1982, Ser. No. 382,829

Int. Cl.³ C01B *33/28*; B01J *29/04*, *29/28*

U.S. Cl. 423—328 16 Claims

1. A method for altering catalytic activity of a synthetic crystalline zeolite characterized as having a crystal structure which provides constrained access to and egress from the intracrystalline free space by virtue of having a pore dimension greater than about 5 Angstroms and pore windows of about a size as would be provided by 10-membered rings of oxygen atoms which comprises the sequential steps of synthesizing said zeolite from a reaction mixture containing a source of bulky organic cations, contacting the synthesized zeolite with an aqueous hydrogen fluoride solution of from about 0.005 Normal to about 0.5 Normal at a temperature of from about ambient to about 100° C. and a pressure of from about atmospheric to about 40 psig for a contact time of from about 1 hour to about 10 hours, calcining the hydrogen fluoride solution contacted zeolite at a temperature of from about 200° C. to about 600° C., contacting the calcined zeolite with an ammonium exchange solution at a temperature of from about ambient to about 100° C., and calcining the ammonium exchange solution contacted zeolite at a temperature of from about 200° C. to about 600° C.

4,414,190
METHOD OF PREPARING SILICON NITRIDE

Motoo Seimiya, Yokosukashi, and Katsutoshi Nishida, Yokohamashi, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 188,101, Sep. 17, 1980. This application Mar. 15, 1982, Ser. No. 358,433

Claims priority, application Japan, Nov. 22, 1979, 54-150739

Int. Cl.³ C01B *21/06*

U.S. Cl. 423—344 **11 Claims**

1. In a method of producing silicon nitride of high α-Si_3N_4 content, which method consists essentially of heating silica in the presence of a carbon source and a nitrogen source, the improvement consisting in utilizing as said silica a wet process white carbon having a mean particle size between 0.015 and 0.035 micron, and having a surface area between 50 and 350 m^2/g, said wet process white carbon having been produced by the process consisting essentially of dissociating an alkali metal silicate with an acid.

4,414,191
PROCESS FOR THE PRODUCTION OF AMMONIA

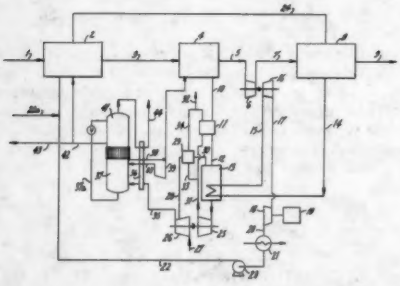
Andrija Fuderer, Antwerp, Belgium, assignor to Union Carbide Corporation, Danbury, Conn.

Filed Aug. 7, 1981, Ser. No. 290,926

The portion of the term of this patent subsequent to Mar. 1, 2000, has been disclaimed.

Int. Cl.³ C01C *1/04*

U.S. Cl. 423—359 **31 Claims**



1. An improved process for the production of ammonia comprising:

(a) passing a hydrogen-containing feed gas at an adsorption pressure of from about 300 to about 1,000 psia to a multiple bed pressure swing adsorption system capable of selectively adsorbing impurities from said hydrogen, each bed of said system undergoing the processing cycle of:

(i) introduction of feed gas to the bed inlet end at said adsorption pressure, with adsorption of impurities therefrom and discharge of an unadsorbed, purified hydrogen stream from the discharged end thereof;

(ii) partial cocurrent depressurization of the bed with release of hydrogen-containing void space gas from the discharge end of the bed;

(iii) production of said released void space gas to the discharge end of an adsorption bed undergoing repressurization to equalize the pressure therebetween;

(iv) countercurrent depressurization of the bed with release of gas from the inlet end thereof for blowdown to its lower desorption pressure;

(v) introduction of purge gas to the discharge end of the bed at its desorption pressure for the purging thereof, with the discharge of said purge gas from the inlet end of the bed; and

(vi) repressurization of the purged bed to said adsorption pressure; and

(vii) repetition of said cyclic steps (i)-(vi) with additional quantities of feed gas;

(b) passing nitrogen to the discharge end of each bed as said purging gas at an elevated purge pressure of from about 60 to about 100 psia, the unadsorbed, purified hydrogen stream, withdrawn from each bed at said adsorption pressure during the next succeeding adsorption step containing from about 16% to about 26% by volume nitrogen, said nitrogen comprising residual amounts of purge gas remaining in the bed upon completion of said purge; and

(c) synthesizing ammonia from said purified hydrogen-nitrogen gas discharged from said adsorption system,

whereby the purified hydrogen-nitrogen gas discharged from said pressure swing adsorption system at said adsorption pressure can advantageously be employed for the synthesis of ammonia.

4,414,192
METHOD OF PRODUCING A HIGHLY REACTIVE PITCH FRACTION AND ITS USAGE

Jürgen Palm, Oer-Erkenschwick; Herbert Glaser, Gladbeck; Gerd Collin, Duisburg; Rolf Marrett and Maximilian Zander, both of Castrop-Rauxel, all of Fed. Rep. of Germany, assignors to Rutgerswerke Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Sep. 7, 1982, Ser. No. 415,636

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1981, 3142826

Int. Cl.³ C01B *31/02;* **C10C** *3/02, 3/08;* **D01F** *9/12*

U.S. Cl. 423—445 **4 Claims**

1. A method of producing a highly reactive pitch fraction from a coal-tar pitch solution obtained through extraction, comprising treating a coal-tar pitch extract in a chloroform solution with 1-10% by weight of solid iodine at room temperature with agitation for 1-3 hours to obtain solid reaction products, separating said products and, in the presence of chloroform, decomposing said products with an aqueous ammonium solution and, following separation of the aqueous phase and removal by distillation of the solvent, recovering the highly reactive pitch fraction as a residue.

4,414,193
PRODUCTION OF CHLORINE DIOXIDE ON A SMALL SCALE

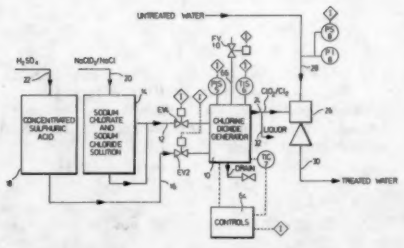
Maurice C. J. Fredette, and Gerald Cowley, both of Mississauga, Canada, assignors to ERCO Industries Limited, Islington, Canada

Filed Sep. 16, 1982, Ser. No. 418,732

Claims priority, application Canada, Sep. 9, 1982, 411094

Int. Cl.³ C01B *11/02*

U.S. Cl. 423—478 **18 Claims**



1. A process for the production of chlorine dioxide, which comprises:

reducing chlorate ions with chloride ions in an aqueous acid reaction medium to form chlorine dioxide and chlorine, said reaction medium containing sulphuric acid, having a total acid normality of about 8.5 to about 12 normal and

containing by-product sulphate salt in a concentration insufficient to saturate the same,

subjecting said reacting zone to a subatmospheric pressure to draw said chlorine dioxide and chlorine from said reaction zone along with water vapor,

feeding chlorate ions, chloride ions and sulphuric acid reactants to said reaction zone and removing spent reaction medium from the reaction zone at a flow rate which substantially balances the flow of water into the reaction zone with said reactants and out of the reaction zone with said water vapor and said removal spent reaction medium, and

controlling the residence time of reaction medium in said reaction zone to maintain said concentration of by-product sulphate salt insufficient to saturate said reaction medium.

4,414,194

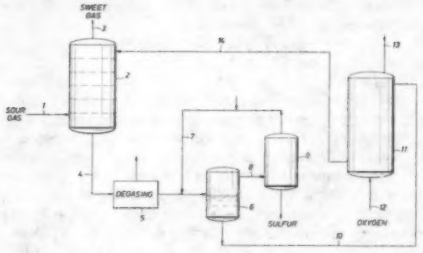
EXTRACTION PROCESS

George C. Blytas, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 267,202, May 26, 1981, abandoned. This application Mar. 26, 1982, Ser. No. 362,337

Int. Cl.³ C01B *17/04*; B01D *53/34*

U.S. Cl. 423—573 G **13 Claims**



1. A process for the removal of H_2S from a sour gaseous stream comprising:

(a) contacting the sour gaseous stream in a contacting zone with an aqueous reaction solution at a temperature below the melting point of sulfur, the mixture comprising an effective amount of a reactant selected from the group consisting of polyvalent metallic ions and polyvalent metal chelate compounds, and mixtures thereof, to produce a sweet gas stream and an aqueous admixture containing sulfur and reduced reactant;

(b) removing aqueous admixture from the contacting zone;

(c) contacting said aqueous admixture in an extraction zone with a liquid composition selected from compounds having the formula $C_nH_{2n+1}OH$, wherein n is a number from 4 through 15, and mixtures thereof, in an amount sufficient to remove at least the bulk of the sulfur from said aqueous admixture and produce a separate liquid layer containing sulfur and said composition, and forming a three phase mass comprising an upper liquid layer comprising solid sulfur and said composition, and a lower layer in contact with said upper layer, said lower layer comprising aqueous admixture;

(d) separating at least a portion of the upper liquid layer, and recovering sulfur from the portion separated;

(e) separating aqueous admixture from the lower layer, and regenerating separated aqueous admixture in a regeneration zone to produce an aqueous admixture containing a regenerated reactant;

(f) returning aqueous admixture from the regeneration zone to the contacting zone.

4,414,195

METHOD FOR THE PREPARATION OF DEUTERIUM-ENRICHED WATER

Charles Mandrin, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

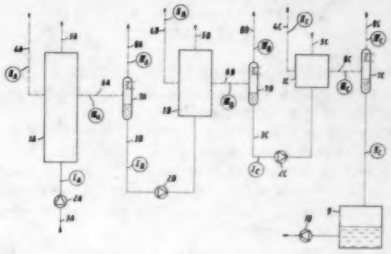
Filed Aug. 4, 1981, Ser. No. 290,097

Claims priority, application Switzerland, Sep. 1, 1980, 6571/80

The portion of the term of this patent subsequent to Aug. 4, 1998, has been disclaimed.

Int. Cl.³ C01B *5/00*

U.S. Cl. 423—580 **8 Claims**



1. A method for the preparation of deuterium-enriched water, said method comprising the steps of

supplying a carbonaceous feedstock selected from the group consisting of carbon and at least one hydrocarbon, and at least one of water and steam in excess to a first unit of a hydrogen production plant having at least two separating units for obtaining synthesis gas;

separating an effluent from the first unit into a gaseous component and a liquid component consisting of deuterium-enriched water;

isolating the liquid component;

introducing the deuterium-enriched water into a second unit of the plant;

contacting the deuterium-enriched water in the second unit with a smaller quantity of feedstock than in the first unit;

separating an effluent from the second unit into a liquid component consisting of deuterium-enriched water and a gaseous component; and

supplying the deuterium-enriched water from the second unit to a plant for production of heavy water.

4,414,196

METHOD OF PRODUCING SINGLE CRYSTALLINE, ACICULAR α-FERRIC OXIDE

Seiji Matsumoto, Sakai; Tadashi Koga, Osaka; Kiyoshi Fukai, Izumiotsu, and Hideji Yamamoto, Asahimachi, all of Japan, assignors to Sakai Chemical Industry Co., Ltd., Japan

Filed Nov. 18, 1981, Ser. No. 322,666

Claims priority, application Japan, Nov. 27, 1980, 55-167668

Int. Cl.³ C01G *49/06*

U.S. Cl. 423—633 **14 Claims**

1. A method of producing single crystalline, acicular α-ferric oxide of narrow particle size distribution which comprises: heating an aqueous suspension of amorphous ferric hydroxide at an elevated temperature from 100° C. to 250° C. at an alkaline pH in the presence of an effective amount of at least one growth regulating agent dissolved in the suspension and α-ferric oxide seed crystals of minor axes not more than 0.4 microns in average in amounts of 0.1–25 mole % in terms of Fe content in relation to the ferric hydroxide in the suspension, the growth regulating agent being selected from the group consising of an organic phosphonic acid, a hydroxycarboxylic acid, a polybasic acid, an aminocarboxylic acid, an aminosulfonic acid, an aromatic sulfonic acid, a thiocarboxylic acid, a water soluble salt of any one of the acids, a water soluble ester of any one of

the acids, a polyamine, a thioalcohol, a polyhydric alcohol and a β-dicarbonyl compound, for a length of time sufficient to convert the amorphous ferric hydroxide into the acicular α-ferric oxide.

4,414,197

METHOD FOR PREPARING PERMANENT SLIDES OF RARE SORTED CELLS

Richard A. Dussault, Seekonk, Mass., assignor to Ortho Diagnostic Systems Inc., Raritan, N.J.

Filed Mar. 19, 1982, Ser. No. 360,119
Int. Cl.³ G02B *21/34*
U.S. Cl. 424—3 **4 Claims**

1. A method for preparing permanent slides of rare sorted cells present in a suspending solution comprising the steps o:

(a) providing a microscope slide;

(b) further providing means for retaining cells, said retainer means having at least one well;

(c) coating one side of both the microscope slide and the retainer means with an effective amount of serum albumin for substantially sealing capillary passages between the slide and retainer means;

(d) contacting together the coated sides of the microscope slide and retainer means to form a slide-retainer means sandwich;

(e) partially filling the well with an effective amount of serum albumin for retaining the cells in the well;

(f) depositing the sorted cells into the well;

(g) centrifuging the slide-retainer means sandwich whereby the cells are contacted with and retained by the serum albumin; and

(h) removing the retainer means and excess suspending solution.

4,414,198

RAPIDLY DISINTEGRABLE TABLET COMPOSITION AND METHOD

Joseph Michaelson, 4767 Elmer Ave., North Hollywood, Calif. 91602

Filed Apr. 23, 1982, Ser. No. 371,517
Int. Cl.³ A61K *9/26, 9/36, 9/62, 9/04*
U.S. Cl. 424—44 **19 Claims**

1. Rapidly water-disintegrable tablet comprising an active ingredient, and distributed therewithin a small but effective amount of a tablet disintegrable system comprising an unreacted, intimate mixture of alginic acid and a water soluble carbonate radical precursor in proportions reactive to form metal alginic acid salt and carbonic acid when the tablet is placed in water, the bulk of said formed salt acting to swell the tablet and the carbonic acid acting to simultaneously release carbon dioxide within the swelling tablet whereby rapid disintegration of the tablet is effected, the alginic acid salt acting to body the resulting active ingredient solution.

4,414,199

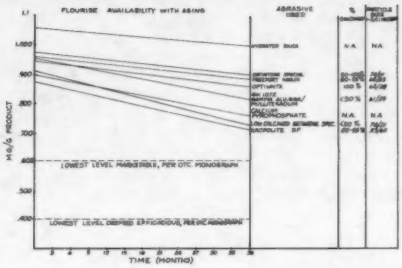
TOOTHPASTE

John R. Strobridge, Comstock Park, Mich., assignor to Amway Corporation, Ada, Mich.

Filed Jul. 15, 1982, Ser. No. 398,343
Int. Cl.³ A61K *7/16, 7/18*
U.S. Cl. 424—52 **20 Claims**

1. In a toothpaste containing fluoride and calcined kaolin, the improvement comprising:

the calcined kaolin being at least 80% calcined to the mullite crystal form, the majority of the particles being sufficiently fine to afford good polishing without excess abrasion, but no more than about 35% of the particles being less than 1 micron in diameter.



4,414,200

POWDER STICK COMPOSITION FOR TOPICAL APPLICATION

John H. Murphy, Matamoras, Pa.; Jon D. Packer, and Dennis R. Brown, both of Port Jervis, N.Y., assignors to Kolmar Laboratories, Inc., Port Jervis, N.Y.

Filed Mar. 17, 1980, Ser. No. 130,969
Int. Cl.³ A61K *7/02, 7/34*
U.S. Cl. 424—63 **12 Claims**

1. A method of preparing a cosmetic powder product, comprising the steps of mixing at an elevated temperature a fatty alcohol containing 12 to 22 carbon atoms in the molecule, a finely divided filler, and a sufficient quantity of a liquid cyclic evaporable siloxane to form a liquid moldable slurry, introducing the slurry into a mold, solidifying the slurry to provide a solid molded product, evaporating the major portion of the siloxane from the molded product to provide a dried powder product, and thereafter packaging said product, said product having excellent pay off and high resistance to humidity absorption.

4,414,201

IMMUNOPOTENTIATOR CONTAINING ABRIN

Hiroshi Shionoya, Tokorozawa; Haruyoshi Arai, Inuyama; Nozomu Koyanagi, Niiza, and Hitoshi Takeuchi, Tokyo, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 204,786, Nov. 7, 1980, abandoned. This application Jun. 1, 1982, Ser. No. 384,324
Claims priority, application Japan, Nov. 9, 1979, 54-144326
Int. Cl.³ A61K *37/00, 39/00*
U.S. Cl. 424—88 **1 Claim**

1. A method for enhancing immune response to intra-cellular and extra-cellular parasitic bacteria in a human or animal subject in need of such treatment which comprises parenterally administering abrin to such human or animal subject in an amount of from at least about 3 ng per human or animal subject up to 1.5 μg/kg of the body weight of the human or animal subject.

4,414,202

COMPOSITION FOR TREATMENT OF WOUNDS

Anthony N. Silvetti, 930 Ashland Ave., River Forest, Ill. 60305

Continuation of Ser. No. 117,717, Feb. 19, 1980, abandoned. This application Sep. 14, 1981, Ser. No. 301,472
Int. Cl.³ A61K *31/70, 33/26*
U.S. Cl. 424—147 **6 Claims**

1. A composition for application to skin wounds comprising, in effective amounts:

(a) a starch hydrolysate having a Dextrose Equivalent less than about 35; and

(b) at least one component selected from the group consisting of alphaketoglutaric acid and alphaketoglutarate salts.

4,414,203

PERIODONTAL POWDER CONTAINING EXSICCATED POTASSIUM ALUM

Alberto M. Cabardo, Jr., 197 N. Washington St., Battle Creek, Mich. 49016

Division of Ser. No. 848,802, Nov. 7, 1977, Pat. No. 4,276,287, which is a continuation of Ser. No. 618,618, Apr. 29, 1976, abandoned, which is a continuation-in-part of Ser. No. 256,388, May 24, 1972, abandoned. This application Apr. 16, 1981, Ser. No. 255,031

Int. Cl.[3] **A61K** *33/06, 7/16, 33/00, 7/24*

U.S. Cl. 424—154 **18 Claims**

1. A periodontal powder composition useful in periodontal treatment comprising a mixture of evenly exsiccated potassium alum and sodium bicarbonate in a ratio, by weight, of approximately 2:1 of said potassium alum to said sodium bicarbonate.

4,414,204

ANTIBIOTIC PREPARATIONS HAVING INCREASED EFFECTIVENESS, PROCESSES FOR THEIR MANUFACTURE AND METHOD FOR INCREASING THE ANTIBIOTIC ACTION OF ANTIBIOTICS

Lajos Tarcsay, Grenzach-Wyhlen, Fed. Rep. of Germany; Gerhard Baschang, Bettingen, Switzerland; Albert Hartmann, Grenzach, Fed. Rep. of Germany, and Jaroslav Stanek, Birsfelden, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

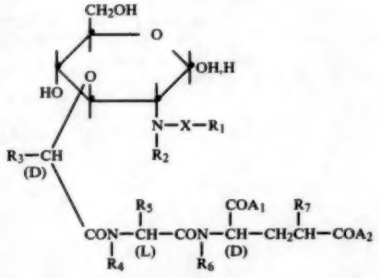
Continuation-in-part of Ser. No. 172,035, Jul. 24, 1980, abandoned. This application Jan. 21, 1981, Ser. No. 226,966

Claims priority, application Switzerland, Jul. 25, 1979, 6893/79

Int. Cl.[3] **A61K** *37/02, 31/71;* **C07C** *103/52*

U.S. Cl. 424—177 **29 Claims**

1. Pharmaceutical preparations with antibiotic activity comprising an antibiotically effective amount of a combination of at least one antibiotic and an amount effective to increase the activity of said antibiotic of at least one muramylpeptide of the formula (I)



(I)

wherein

X represents carbonyl or carbonyloxy,

R_1 represents optionally substituted alkyl or aryl,

R_2, R_4 and R_6 represent hydrogen or lower alkyl,

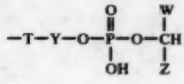
R_3 represents hydrogen or lower alkyl,

R_5 represents hydrogen, lower alkyl, free or functionally modified hydroxy-lower alkyl, free or functionally modified mercapto-lower alkyl, optionally substituted amino-lower alkyl, cycloalkyl, cycloalkyl-lower alkyl, optionally substituted aryl or aralkyl, nitrogen-containing heterocyclyl or heterocyclyl-lower alkyl, or

R_4 and R_5 together represent also alkylene having 3 or 4 carbon atoms,

R_7 represents hydrogen or optionally esterified or amidated carboxyl, and

one of the radicals A_1 and A_2 represents a radical of the formula



(II)

wherein

T represents NH or O,

Y represents an optionally substituted alkylene group that can also be interrupted by one or two oxycarbonyl and/or iminocarbonyl groups,

W represents hydrogen, and

Z represents a 1,2-dihydroxyethyl or 2-hydroxyethyl group in which at least one hydroxy group is esterified by an optionally unsaturated long-chain aliphatic carboxylic acid or etherified by an optionally unsaturated long-chain aliphatic alcohol, or

each of W and Z represents a hydroxymethyl group esterified by an optionally unsaturated long-chain aliphatic carboxylic acid or etherified by an optionally unsaturated long-chain aliphatic alcohol,

and the other of the radicals

A_1 and A_2 represents free or etherified hydroxy, free or alkylated amino, lower alkylamino or aminocarbonyl-lower alkylamino,

and/or a pharmaceutically acceptable salt thereof together with a significant amount of a pharmaceutically acceptable carrier.

4,414,205

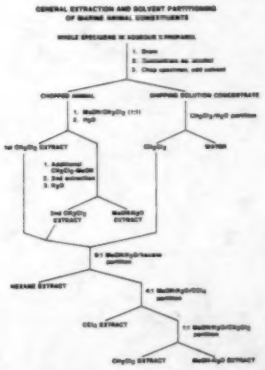
CELL GROWTH INHIBITORY SUBSTANCES

George R. Pettit, Paradise Valley, Ariz., assignor to University Patents, Inc., Tempe, Ariz.

Filed Aug. 28, 1981, Ser. No. 297,473

Int. Cl.[3] **A61K** *37/00, 35/56;* **C07G** *7/00*

U.S. Cl. 424—177 **10 Claims**



1. Cell growth inhibitory substance designated dolastatin 1 which has the following characteristics:

Melting point—105°–111° C.;

Thin layer chromatography (spots visualized by UV light or I_2 vapor; I_2 spots are yellow);

Solvent system	Rf
(AcOEt/EtOH 96:4)	0.41
($CHCl_3$/EtOH 95:5)	0.23

-continued

Solvent system	Rf
($CHCl_3$/MeOH/H_2O 90:10:0.8)	0.46

Ultraviolet spectrum
λMeOH/max 218.8, 230(sh) and 243(sh)nM;
Mass spectrum (Field desorption)
MW=991±1
+Ion±1: 1038 $(M+2Na-H)^+$ 1014 $(M+Na)^+$, 807, 668, 551, 100
+Ion±2: 783, 680, 409, 381;
Proton magnetic resonance
"$CDCl_3$" (0.8% solution in $CDCl_3$)-60 MHz δ:0.90 (s), 0.99 (large peak), 1.05 (s), 1.10 (s), 1.18 (s), 1.26 (s), 1.80 (m), 2.06 (m), 2.17 (s), 2.28 (s, large peak), 2.44 (m), 3.03 (s), 3.16 (s), 3.34 (s, large peak), 3.38 (broad s), 3.90 (m), 4.12 (m), 4.80 (m), 5.57 (m), 6.91 (m), 7.22 (s, large peak), 7.26 (s), 7.73 (d, J=3.5 Hz);
"Acetone-d_6" (0.8% solution in acetone d_6)-60 MHz δ0.82 (s), 0.94 (m, large peak), 1.15 (m), 1.23 (s), 1.70 (m), 2.28 (s, large peak), 2.48 (m), 3.10 (s), 3.22 (s), 3.30 (s), 3.34 (s), 3.45 (m), 3.58 (m), 3.92 (m), 4.15, 4.81 (m), 5.69 (t); $CDCl_3$-90 MHz
δ: 0.89 (s), 0.96 (s), 0.99 (s), 1.06 (s), 1.10 (s), 1.18 (s), 1.26 (s, large peak), 1.42 (s), 1.66 (broad s, large), 1.98 (s), 2.06 (s), 2.30 (broad s, large), 2.42 (s), 3.03 (s), 3.16 (s), 3.33 (s, large peak), 3.38 (s), 3.72 (s), 3.90 (m), 4.12 (m), 4.80 (q. J=2.5 Hz and J=5.0 Hz), 5.30 (s), 5.57 (q. J=2.5 Hz and 7.5 Hz), 6.91 (m), 7.22 (s), 7.26 (s, large peak), 7.74 (d., J=3.5 Hz).

4. A process for treating an animal or human hosting a neoplastic disease which comprises the administration of an effective amount of dolastatin 1 to said host.

7. A process for preparing dolastatins active against P388 leukemia which comprises:

(a) extracting a ground preparation of the Indian Ocean sea hare Dolabella with ethanol to obtain an ethanolic extract;
(b) subjecting said ethanolic extract to solvent partitioning to obtain an extract showing activity against P388 leukemia;
(c) chromatographing said active extract and isolating the fractions active against P388 leukemia; and,
(d) rechromatographing said active fraction to obtain further fractions active against P388 leukemia.

4,414,206

ANIMAL FEEDS

Maxwell Gordon, Dewitt, and George J. Christie, Skaneateles, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation of Ser. No. 156,787, Jun. 12, 1980, abandoned, which is a continuation-in-part of Ser. No. 59,011, Jul. 19, 1979, abandoned. This application Jan. 11, 1982, Ser. No. 338,393

Int. Cl.³ A61K *37/00*

U.S. Cl. 424—177 **2 Claims**

1. A method for altering rumen digestion in ruminant animals having a developed rumen function so as to increase the production of propionates, decrease the production of acetates and suppress the production of methane, which method comprises the oral administration to ruminant animals in need thereof feed containing amphomycin at a concentration of from about 4 to 100 grams per ton of feed.

4,414,207

RUTIN POLY(H-)SULFATE SALTS AND RELATED COMPOUNDS

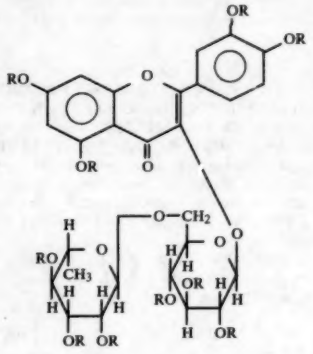
Vijay G. Nair, New York, and Seymour Bernstein, New City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 181,251, Aug. 25, 1980, Pat. No. 4,334,058, which is a continuation-in-part of Ser. No. 62,587, Jul. 3, 1979, abandoned, which is a continuation-in-part of Ser. No. 966,423, Dec. 4, 1978, abandoned. This application Feb. 22, 1982, Ser. No. 350,677

Int. Cl.³ A61K *31/70*

U.S. Cl. 424—180 **15 Claims**

1. A method of inhibiting the complement system in a body fluid which comprises subjecting said body fluid to the action of an effective complement inhibiting amount of a rutin poly(H-)sulfate of the formula:



wherein each R is selected from the group consisting of hydrogen and $-SO_3A$; wherein A is a pharmaceutically acceptable salt cation; with the proviso that at least six of the R groups are $-SO_3A$.

4,414,208

O,S-DIALKYL-O-(4-FLUOROPHENYL)-(DI)THIOPHOSPHORIC ACID ESTERS, AND THE USE THEREOF FOR COMBATING PESTS

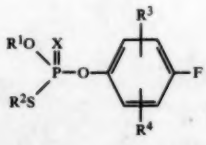
Hans-Peter Loeffler, Ludwigshafen, and Heinrich Adolphi, Limburgerhof, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 166,572, Jul. 7, 1980, abandoned. This application Jan. 4, 1982, Ser. No. 337,076

Int. Cl.³ C07F *9/165;* **A01N** *57/14*

U.S. Cl. 424—224 **3 Claims**

1. O,S-Dialkyl-O-(4-fluorophenyl)-(di)thiophosphoric acid esters of the formula



I

where R^1 is ethyl, R^2 is propyl or butyl, R^3 is hydrogen, or halogen, R^4 is hydrogen, halogen or methyl and X is oxygen or sulfur.

3. A process for combating insects and Arachnida pests, wherein O,S-dialkyl-O-(4-fluorophenyl-(di)thiophosphoric acid esters of claim **1** are allowed to act on the pests of their habitat.

4,414,209
MICRONIZED AEROSOL STEROIDS

Peter B. Cook, Standon, and John H. Hunt, Theydon Bois, both of England, assignors to Allen & Hanburys Limited, London, England

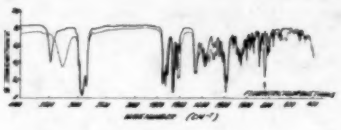
Division of Ser. No. 703,821, Jul. 9, 1976, Pat. No. 4,044,126, which is a continuation of Ser. No. 352,187, Apr. 18, 1973, abandoned. This application Jun. 13, 1977, Ser. No. 805,910

Claims priority, application United Kingdom, Apr. 20, 1972, 18421/72

The portion of the term of this patent subsequent to Aug. 23, 1994, has been disclaimed.

Int. Cl.[3] **A61K** *31/56;* **C07J** *7/00*

U.S. Cl. 424—243 **10 Claims**



1. An antiinflammatory steroid in the form of a crystalline solvate with a halogenated hydrocarbon or said crystalline solvate from which part or all of the halogenated hydrocarbon has been removed, wherein said halogenated hydrocarbon is a chloro or chlorofluoro hydrocarbon having 1 or 2 carbon atoms; said steroid is beclomethasone dipropionate, betamethasone-21-acetate-17-isobutyrate or 21-chloro-21-desoxybetamethasone-17-propionate, said steroid being stabilized with respect to further crystal growth in a chloro or chlorofluoro hydrocarbon solvent having 1 or 2 carbon atoms and the particle size of substantially all of the steroid material being such as to permit inhalation into the human bronchial system.

4,414,210
2-HYDROXYARYLETHYLTRIAZOLE FUNGICIDES

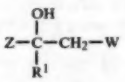
George A. Miller, Maple Glen, and Hak-Foon Chan, Doylestown, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 81,227, Oct. 2, 1979, abandoned, which is a division of Ser. No. 852,125, Nov. 16, 1977, abandoned. This application May 19, 1981, Ser. No. 264,999

Int. Cl.[3] **A01N** *43/64, 55/02;* **C07D** *249/08;* **C07F** *1/08*

U.S. Cl. 424—245 **12 Claims**

1. A compound of the formula



wherein

Z is an unsubstituted phenyl or naphthyl group or a phenyl or naphthyl group substituted with up to three substituents selected from the group consisting of halogen, nitro, trihalomethyl, cyano, $(C_1–C_4)$alkyl, $(C_1–C_4)$alkoxy, $(C_1–C_4)$alkylthio, $(C_1–C_4)$alkylsulfinyl, $(C_1–C_4)$alkylsulfonyl, phenoxy, phenylthio, phenylsulfinyl, phenylsulfonyl and phenoxy, phenylthio, phenylsulfinyl or phenylsulfonyl substituted with up to two substituents selected from the group consisting of halogen, nitro, trifluoromethyl, cyano, methyl, methoxy, methylthio, methylsulfinyl and methylsulfonyl;

R^1 is cyano $(C_3–C_{12})$alkyl, $(C_3–C_8)$cycloalkyl, $(C_2–C_8)$alkenyl, $(C_5–C_8)$cycloalkenyl, $(C_2–C_8)$alkynyl, unsubstituted phenyl or phenyl substituted with up to two substituents selected from the group consisting of halogen, nitro, trihalomethyl, cyano, methyl, methoxy, methylsulfinyl and methylsulfonyl; or unsubstituted benzyl or phenethyl, or benzyl or phenethyl substituted with up to two substituents selected from the group consisting of halogen, nitro, trihalomethyl, cyano, methyl, methoxy, methylthio, methylsulfinyl, and methylsulfonyl; and

W is a 1 or 4-(1,2,4-triazole);

and the agronomically acceptable acid addition salts and metal said complexes thereof.

4,414,211
HETEROCYCLIC DERIVATIVES OF GUANIDINE

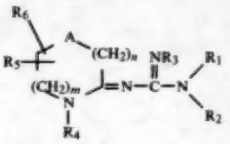
Chris R. Rasmussen, Ambler, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.

Continuation-in-part of Ser. No. 943,099, Sep. 18, 1978, abandoned. This application Mar. 14, 1980, Ser. No. 130,272

Int. Cl.[3] **A61K** *31/42, 31/425, 31/535, 31/54;* **C07D** *263/16, 265/30, 277/18, 279/12*

U.S. Cl. 424—246 **33 Claims**

1. A heterocyclic derivative of guanidine selected from the group consisting of a compound having the formula:



(I)

and the pharmaceutically acceptable acid addition salts thereof wherein:

A is a member selected from the group consisting of O and S;

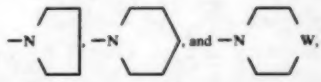
n is the integer 0, 1, 2, 3;

m is the integer 0, 1, 2, 3, provided that n+m=1, 2, or 3;

R_1 is a member selected from the group consisting of methyl and ethyl;

R_2 is a member selected from the group consisting of loweralkyl, cyclopentyl, cyclohexyl, and benzyl;

taken together represents a member selected from the group consisting of:



wherein W is a member selected from the group consisting of O, S, N-loweralkyl and N-aryl; and

R_3 is a member selected from the group consisting of:

alkyl having from 4 to 10 carbons;

phenyl, methylenedioxypheny; phenyl substituted with from 1 to 3 substituents each selected from the group consisting of halo, loweralkyl and loweralkoxy; phenyl substituted with a member selected from the group consisting of hydroxy, benzyloxy, loweralkanoyloxy, nitro; trifluoromethyl and methylthio;

naphthyl;

cyclopentyl; cyclohexyl;

exo-2-norbornyl; endo-2-norbornyl; 1-adamantyl;

arylalkyl in which the aryl function is phenyl and the alkyl function has from 1 to 4 carbons; and

diphenylalkyl in which the alkyl function has from 1 to 2 carbons;

R_4 is a member selected from the group methyl, ethyl, n-propyl, i-propyl, n-butyl and isobutyl;

R_5 is H or loweralkyl having from 1 to 4 carbons; and

R_6 is H or loweralkyl having from 1 to 4 carbons.

4,414,212
METHOD OF TREATMENT OF PRE-MENSTRUAL SYNDROME

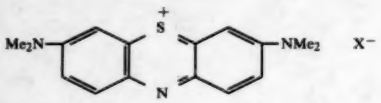
Graham J. Naylor, Lugate, Lucklawhill Balmiallo, St. Andrews, Fife, Scotland (KY16 OBQ), assignor to Graham J. Naylor and Pamela H. Naylor, both of Andrews, Scotland

Filed Mar. 2, 1982, Ser. No. 354,065

Int. Cl.³ A61K *31/54, 31/365, 31/195, 37/00*

U.S. Cl. 424—247 **10 Claims**

1. A method of treatment of pre-menstrual syndrome in a female patient suffering from pre-menstrual syndrome, said method comprising the step of administering to said patient a therapeutically effective dosage of at least one compound selected from the group consisting of ascorbic acid, physiologically acceptable salts and esters thereof, EDTA, glutathione, physiologically acceptable salts and esters thereof, and a compound of Formula I



(I)

wherein X is a physiologically acceptable anion, and bioprecursors thereof.

4,414,213
DIHYDROPYRIDYL CYCLIC IMIDATE ESTERS AND THEIR PHARMACEUTICAL USE

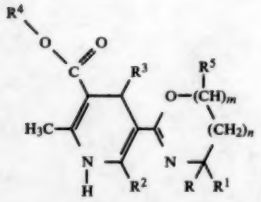
Graham S. Poindexter, and David L. Temple, Jr., both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Filed Mar. 22, 1982, Ser. No. 360,758

Int. Cl.³ A61K *31/44;* **C07D** *211/90, 263/14*

U.S. Cl. 424—248.5 **40 Claims**

1. A compound having the formula



and the pharmaceutically acceptable acid addition salts thereof wherein

R and R^1 are independently selected from hydrogen, lower (C_1–C_4) alkyl or lower alkoxy-lower alkyl groups;

R^2 is lower alkyl, phenyl, or thienyl;

R^3 is cycloalkyl of 5 to 7 carbon atons, bicycloalkenyl of 7 to 9 carbon atoms, furanyl, indolyl, pyridyl, thienyl, phenyl, naphthyl, or substituted phenyl with the substituents comprising acetamino, C_1–C_4 alkyl, C_1–C_4 alkoxy, cyano, halogen, hydroxyl, nitro, trifluoromethyl, trifluoromethylsulfonyl, and methylsulfonyl;

R^4 is lower alkyl, lower alkoxy-lower alkyl, amino-lower alkyl, halo-lower alkyl, or di-lower alkylamino-lower alkyl;

R^5 is lower alkyl or aryl;

m is 0 or 1; and

n is 0, 1, or 2.

38. The method of exerting a vasodilating effect in a mammalian host which comprises administering to a mammal having a condition in which therapeutic benefit is derived from vasodilation, a non-toxic effective vasodilating dose of a compound as claimed in claim 1.

4,414,214
BENZODIOXOLE DERIVATIVES AND PHARMACEUTICAL USE THEREOF

Ernst Habicht, Oberwil, and Paul Zbinden, Witterswil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

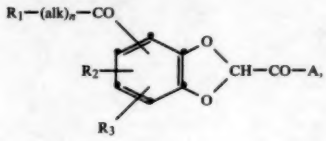
Filed Apr. 19, 1982, Ser. No. 369,873

Claims priority, application Switzerland, Apr. 24, 1981, 2698/81

Int. Cl.³ A61K *31/335;* **C07D** *317/68*

U.S. Cl. 424—248.51 **22 Claims**

1. A benzodioxole derivative of the formula I



(I)

in which

R_1 represents phenyl, thienyl or furyl, each of which is unsubstituted or substituted by lower alkyl, lower alkoxy or halogen,

alk represents an alkylene or alkylidene radical having a maximum of 5 carbon atoms,

n represents 0 or 1,

R_2 and R_3 each represents, independently of the other, hydrogen, lower alkyl, lower alkoxy or halogen, and

A represents the radical O—R_4, wherein R_4 represents hydrogen or lower alkyl, or A represents the radical

in which either R_5 and R_6 each represents, independently of the other, hydrogen or lower alkyl, or R_5 and R_6 are bonded to one another and, together with the adjacent nitrogen atom, represent unsubstituted or lower alkyl-substituted tetra- to hexamethyleneimino or 4-morpholinyl, in the form of racemates or optical antipodes, and the salts of a compound of the formula I in which A represents OR_4 wherein R_4 represents hydrogen, with bases, and the acid addition salts of a compound of the formula I in which the radical R_1 has a basic character.

19. A method for treating oedema or hypertension in a mammal comprising administering to said mammal a therapeutically effective amount of a compound according to claim 1 or of a pharmaceutically acceptable salt of a compound according to claim 1 that is capable of salt formation.

4,414,215
N-ACYL DERIVATIVES OF 6-ALKYLAMINO 5-CHLORO-3-NITROPYRAZINAMINES FOR RADIATION THERAPY

George D. Hartman, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

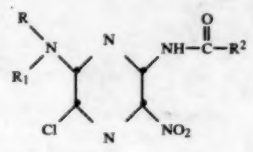
Continuation-in-part of Ser. No. 295,445, Aug. 24, 1981, abandoned, which is a continuation-in-part of Ser. No. 194,092, Oct. 6, 1980, abandoned. This application Jul. 19, 1982, Ser. No. 399,382

Int. Cl.³ A61K *31/495;* **C07D** *241/16, 241/20*

U.S. Cl. 424—250 **12 Claims**

1. A pharmaceutical composition useful in enhancing the

therapeutic effect of radiation treatment comprising an effective amount of a radiation enhancing compound of the formula:



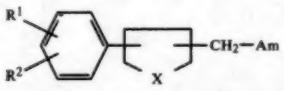
wherein R and R^1 are each hydrogen, C_1–C_6 lower-alkyl and substituted lower alkyl having one or two amino C_{1-6} loweralkylamino or dialkylamino, lower alkoxy, hydroxy or halo C_1–C_6 lower alkenyl, and substituted lower alkenyl having one or two amino, C_1–C_6 alkylamino or dialkylamino, lower alkoxy, or hydroxy groups or when taken together and linked through an additional nitrogen or oxygen constitute a 5–7 member saturated heterocyclic ring comprising a morpholine, a piperazine or an N-substituted piperazine wherein the N-substituent is either hydrogen, C_1–C_6 alkyl, C_1–C_6 hydroxyalkyl, C_1–C_6 alkyl, C_1–C_6 hydroxyalkyl, C_1–C_6 alkoxyalkyl; and R^2 is a lower alkyl substituent;
and a pharmaceutical carrier.

4,414,216
TETRAHYDROFURAN COMPOUNDS AND ANALOGS THEREOF

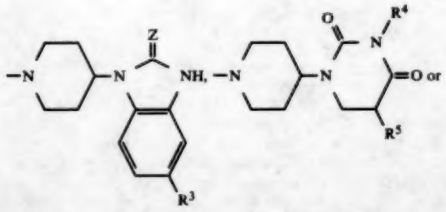
Takeshi Kawakita, Nakatsu; Yasuaki Chihara, Yoshitomi; Takemi Fukuda, Shinyoshitomi; Michihide Setoguchi, and Tetsuya Tahara, both of Nakatsu, all of Japan, assignors to Yoshitomi Phamaceutical Industries, Ltd., Osaka, Japan

Filed Jun. 21, 1982, Ser. No. 390,433
Claims priority, application Japan, Jun. 19, 1981, 56-95744
Int. Cl.[3] **A61K** *31/505, 31/445;* **C07D** *405/14*
U.S. Cl. 424—251 **10 Claims**

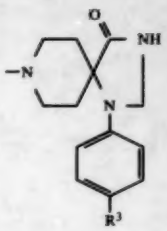
1. A compound of the formula:



or a pharmaceutically acceptable acid addition salt thereof, wherein X is oxygen atom or sulfur atom, R^1 and R^2 are each hydrogen atom, halogen atom, lower alkyl group or lower alkoxy group, and Am is a group of the formula:



-continued



wherein Z is oxygen atom or sulfur atom, R^3 is hydrogen atom or halogen atom, R^4 is hydrogen atom, lower alkyl group or phenyl group which may be substituted by one to three substituents at any position(s) on the phenyl nucleus, each substituent being independently selected from halogen atom, lower alkyl group and lower alkoxy group, and R^5 is hydrogen atom or lower alkyl group.

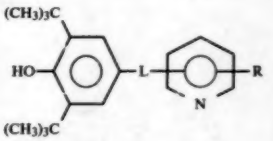
10. A pharmaceutical composition comprising the compound of claim **1** in combination with a pharmaceutically acceptable inert carrier, said compound being present in a therapeutically effective amount.

4,414,217
3,5-DI(T-BUTYL)-4-HYDROXYPHENYL SUBSTITUTED PYRIDINES

George G. I. Moore, Houlton, Wis., assignor to Riker Laboratories, Inc., St. Paul, Minn.

Filed Nov. 23, 1981, Ser. No. 324,062
Int. Cl.[3] **A61K** *31/44;* **C07D** *213/04*
U.S. Cl. 424—263 **12 Claims**

1. Compound of the formula



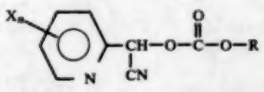
wherein L is a carbon-carbon bond or a carbonyl radical and R is hydrogen or methyl, or a quaternary ammonium salt thereof, with the proviso that when L is a carbonyl radical bonded to the 2-position of the pyridine ring and R is methyl, R is bonded to the 3- or 5-position of the pyridine ring.

4,414,218
CYANO-(SUBSTITUTED AND UNSUBSTITUTED PYRIDINYL) METHYL AND ARYL ESTERS OF CARBONIC ACID

Andrew T. Au, Needham, Mass., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 3, 1982, Ser. No. 354,481
Int. Cl.[3] **C07D** *213/55;* **A01N** *43/40*
U.S. Cl. 424—263 **12 Claims**

1. The pyridinyl cyano carbonates of the formula



wherein:
R is alkyl of up to 20 carbons, phenyl or phenylmethyl;
X is hydrogen, halo, cyano, nitro, R or OR; and

n is 1, 2, 3 or 4, with a proviso that n is 1 or 2 when X is cyano, nitro R or OR.

3. A pesticidal composition comprising an inert horticultural carrier and as a pesticide, a compound of claim 1, the concentration of said pesticide being from 0.0001 to about 50 percent of the total weight of the composition.

4,414,219
ANTIDEPRESSANT (α-PHENYL-2-TOLYL)AZACYCLOALKANOLS AND DERIVATIVES THEREOF

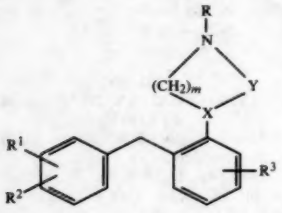
Lawrence L. Martin, Lebanon; Helen H. Ong, Whippany; Vernon B. Anderson, High Bridge, and Charles A. Crichlow, Piscataway, all of N.J., assignors to American Hoechst Corporation, Somerville, N.J.

Division of Ser. No. 6,791, Jan. 25, 1979, Pat. No. 4,241,071, which is a continuation-in-part of Ser. No. 763,294, Jan. 27, 1977, abandoned. This application Aug. 1, 1980, Ser. No. 174,435

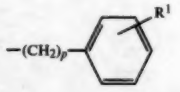
Int. Cl.³ A61K *31/445, 31/40;* **C07D** *211/52, 211/42*

U.S. Cl. 424—267 **50 Claims**

1. A compound of the formula



wherein X is COR^5; Y is $-(CH_2)_n-$; R is hydrogen, loweralkyl, phenylloweralkyl of the formula



or cycloalkylloweralkyl in which the cycloalkyl portion contains from 3 to 6 carbon atoms; R^1, R^2 and R^3 are the same or different and each can be hydrogen, halogen, alkoxy of from 1 to 2 carbon atoms, loweralkyl, hydroxy or trifluoromethyl; R^5 is hydrogen, loweralkyl, carboxylic acid loweralkyl, benzoyl or carboxylic acid lowercycloacyl; m is the integer 1 or 2; n is the integer 1, 2 or 3; the sum of m and n is 3 or 4; p is the integer 1, 2, 3 or 4; or a pharmaceutically acceptable acid addition salt thereof.

47. A method of tranquilizing which comprises administering to a patient in need of tranquilization an effective tranquilizing amount of a compound defined in claim 1.

4,414,220
ORGANIC DIAMINE THERAPEUTIC COMPOSITIONS

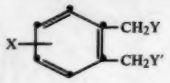
John L. Belletire, Madison, Wis., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 123,063, Feb. 20, 1980, Pat. No. 4,333,932, which is a division of Ser. No. 952,302, Oct. 18, 1978, Pat. No. 4,220,650. This application Mar. 1, 1982, Ser. No. 353,514

Int. Cl.³ A61K *31/445;* **C07D** *401/10*

U.S. Cl. 424—267 **15 Claims**

11. A method for lowering blood sugar in the treatment of a diabetic host, which comprises orally administering to said host an effective blood sugar lowering amount of a compound selected from the group consisting of organic diamine bases of the formula



and the pharmaceutically acceptable acid addition and quaternary ammonium salts thereof, wherein

X is a member selected from the group consisting of hydrogen, fluorine, chlorine, bromine, nitro, cyano, lower alkyl and lower alkoxy and

Y and Y′ are each a member selected from the group consisting of amino, lower N-monoalkylamino, lower N,N-dialkylamino, pyridylamino, pyrrolidino, piperidino, homopiperidino, morpholino, thiomorpholino, 2,3-dihydroisoindolyl and 1,2,3,4-tetrahydroisoquinolyl.

12. The method of claim 11 wherein X is nitro and Y and Y′ are each piperidino.

4,414,221
PESTICIDAL 1,2,4-TRIAZOLE COMPOUNDS

John H. Parsons, Saffron Walden, and Peter J. West, Cambridge, both of England, assignors to FBC Limited, Cambridge, England

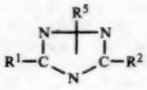
Filed Mar. 20, 1981, Ser. No. 246,042

Claims priority, application United Kingdom, Mar. 22, 1980, 8009769

Int. Cl.³ A01N *43/64, 43/82;* **C07D** *249/08, 249/12*

U.S. Cl. 424—269 **6 Claims**

1. A method of combating acarids, insects or aphids, or their eggs or larvae, which comprises applying to a site infested or liable to infestation therewith, an effective amount of one or more compounds of the formula:



(I)

wherein

R^1 represents phenyl substituted in the 2-position by fluorine, chlorine, bromine or iodine;

R^2 represents cycloalkyl of 3 to 7 carbon atoms, alkoxy of 1 to 6 carbon atoms, or phenyl substituted in the 2-position by halogen or by alkyl of 1 to 6 carbon atoms; and

R^5 represents hydrogen, alkyl of 1 to 6 carbon atoms or alkenyl of 2 to 6 carbon atoms.

4,414,222
ANTHELMINTHIC POUR-ON VETERINARY COMPOSITION

Peter J. Brooker, and John Goose, both of Saffron Walden, England, assignors to Bayer AG, Fed. Rep. of Germany

Division of Ser. No. 832,916, Sep. 13, 1977, Pat. No. 4,336,262, which is a division of Ser. No. 773,111, Feb. 28, 1977, Pat. No. 4,070,467, which is a continuation of Ser. No. 443,522, Feb. 19, 1974, abandoned. This application Dec. 4, 1981, Ser. No. 327,742

Claims priority, application United Kingdom, Feb. 23, 1973, 8972/73; Jan. 25, 1974, 3521/74

The portion of the term of this patent subsequent to Jun. 22, 1999, has been disclaimed.

Int. Cl.³ A61K *31/425*

U.S. Cl. 424—270 **10 Claims**

1. A pour on veterinary composition useful for the treatment of helminthic infestations in animals which comprises an anthelmintically effective amount of tetramisole, levamisole or a nontoxic acid addition salt thereof in combination with an alcohol, or an ester, as diluent suitable for pour-on therapy.

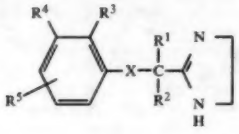
4,414,223

PESTICIDAL ANILINOMETHYLIMIDAZOLINES

Frederick C. Copp, Beckenham; Peter T. Roberts, Berkhamsted; Alexander D. Frenkel, Aston Clinton, and David Collard, Beckenham, all of England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Continuation of Ser. No. 52,860, Jun. 28, 1979, abandoned, which is a division of Ser. No. 862,169, Dec. 19, 1977, abandoned. This application May 18, 1981, Ser. No. 264,305
Claims priority, application United Kingdom, Dec. 20, 1976, 53059/76; Dec. 20, 1976, 53061/76; Dec. 20, 1976, 53062/76
Int. Cl.³ A01N *43/50*
U.S. Cl. 424—273 R 5 Claims

1. A method for preventing pests of the Order Acarina from producing viable eggs which comprises applying to the pest or the pest's environment an effective amount of a compound of formula (I)



(I)

wherein

R^1 and R^2 are hydrogen;

X is NH

R^3 and R^4 are the same or different and are methyl or chloro; and R^5 is hydrogen or an acid addition salt thereof to inhibit the production of viable eggs by said pests.

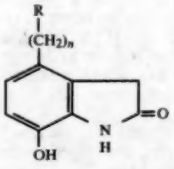
4,414,224

PHARMACEUTICAL COMPOSITION AND METHODS FOR PRODUCING DOPAMINE AGONIST ACTIVITY

William F. Huffman, Malvern, and James W. Wilson, Wayne, both of Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 180,551, Aug. 22, 1980, Pat. No. 4,314,944. This application Jan. 22, 1982, Ser. No. 341,972
Int. Cl.³ A61K *31/405*
U.S. Cl. 424—274 10 Claims

7. The method of producing dopamine agonist activity in a subject in need thereof comprising administering orally or parenterally an effective therefor, nontoxic quantity of a compound of the structural formula:



in which R is amino, lower alkylamino, di-lower alkylamino, di-N-allylamino or N-allyl-N-lower alkyl amino and n is an integer of 1-3; or a pharmaceutically acceptable, acid addition salt thereof, combined with a pharmaceutical carrier in dosage unit form.

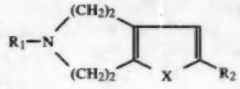
4,414,225

AZEPINE DERIVATIVES AND THEIR ANTI-THROMBOTIC COMPOSITIONS AND METHODS

Robert Sauter, Laupheim; Gerhart Griss, Biberach; Wolfgang Greil, Biberach; Rudolf Hurnaus, Biberach; Bernhard Eisele, Biberach; Walter Haarmann, Biberach, and Eckhard Ruprecht, Aulendorf-Tannhausen, all of Fed. Rep. of Germany, assignors to Dr. Karl Thomae Gesellschaft mit beschränkter Haftung, Biberach an der Riss, Fed. Rep. of Germany

Filed Feb. 12, 1982, Ser. No. 348,496
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1981, 3105858
Int. Cl.³ A61K *31/40*; C07D *495/04*
U.S. Cl. 424—274 7 Claims

1. A compound of the formula



wherein

X is oxygen, sulfur, imino, methylimino, phenylimino or benzylimino;

R_1 is alkyl of 1 to 3 carbon atoms; unsubstituted mono- or di-substituted benzyl, where the substituents are chlorine or bromine; chloro-hydroxybenzyl; bromo-hydroxybenzyl; unsubstituted or mono-substituted benzoyl, where the substituent is chlorine or bromine; alkoxycarbonyl of 2 to 4 carbon atoms; allyl; dodecyl, chloromethoxybenzoyl; or benzyloxycarbonyl; and

R_2 is hydrogen, alkoxycarbonyl of 2 to 4 carbon atoms or carboxyl;

a non-toxic, pharmacologically acceptable acid addition salt thereof; or, when R_2 is carboxyl, a non-toxic, pharmacologically acceptable salt thereof formed with an inorganic or organic base.

7. The method of preventing or relieving thrombosis in a warm-blooded animal, which comprises perorally, parenterally or rectally administering to said animal an effective anti-thrombotic amount of a compound of claim 1.

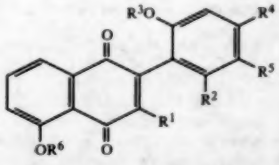
4,414,226

1,4-NAPHTOQUINONE DERIVATIVES AND THEIR USE IN TREATING COCCIDIOSIS

Koichi Ikushima, Toyonaka; Hirokazu Tanaka, Takarazuka; Obe Osamu, Osaka; Eiko Kino, Hadano; Masanobu Kohsaka, Sakai; Hatsuo Aoki, Ikeda; Akira Arakawa, Kusatsu, and Hiroshi Imanaka, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

PCT No. PCT/JP81/00046, § 371 Date Oct. 30, 1981, § 102(e) Date Oct. 30, 1981, PCT Pub. No. WO81/02574, PCT Pub. Date Sep. 17, 1981
PCT Filed Mar. 6, 1981, Ser. No. 317,897
Claims priority, application Japan, Mar. 6, 1980, 55/29675
Int. Cl.³ C07D *311/78*; A61K *31/365*
U.S. Cl. 424—279 6 Claims

1. A 1,4-naphthoquinone derivative of the formula:



wherein R^1 and R^2 taken together represent

R^3 is hydrogen or lower alkyl; R^4 is lower alkyl; R^5 is hydrogen or halogen; and R^6 is hydrogen, lower alkyl or lower alkanoyl.

4,414,227

METHOD FOR REPELLING BIRDS, ESPECIALLY WOODPECKERS

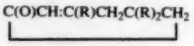
Samuel J. Tomlinson, Sr.; Edward E. Dean, and Leon M. Adams, all of San Antonio, Tex., assignors to Southwest Research Institute, San Antcaio, Tex.

Continuation of Ser. No. 171,152, Jul. 22, 1980, abandoned. This application Apr. 2, 1982, Ser. No. 365,102

Int. Cl.³ A01N *35/00*

U.S. Cl. 424—331 **5 Claims**

1. A method for repelling birds from a surface comprising selecting a surface from which it is desired to repel birds and applying to said surface a repelling amount of the compound of the formula



wherein R is a methyl, ethyl or propyl group.

4,414,228

PROCESS FOR PREPARING DEEP-FROZEN YEAST BREAD DOUGH

Andre Nourigeon, Istres, France, assignor to Grandes Boulangeries Associees G.B.A., Paris, France

Filed Dec. 30, 1981, Ser. No. 336,030

Claims priority, application France, Jan. 8, 1981, 8100215

Int. Cl.³ A21D *8/02;* **C12N** *1/06*

U.S. Cl. 426—19 **3 Claims**

1. Process for preparing deep frozen yeast bread dough comprising the steps of:

(A) deep-freezing yeast at a temperature lower than −15° C. for a sufficient period of time to stabilize the yeast;

(B) incorporating the deep frozen yeast into a dough containing flour, gluten, and malt, wherein said gluten is present in 0.5 to 1% of flour and said malt is present in 0.5 to 2% by weight of flour;

(C) mixing and kneading the dough under conditions whereby the dough does not exceed a temperature of 20° C.;

(D) cooling said dough to a temperature of at least −70° C. at the heart of said dough.

4,414,229

MARGARINE AND THE LIKE SPREAD WITH NATURAL BUTTER FLAVOR

Abraham I. Bakal, Parsippany, N.J., and Allen C. Buhler, Racine, Wis., assignors to Cumberland Packing Corp., Brooklyn, N.Y.

Filed Nov. 23, 1981, Ser. No. 323,548

Int. Cl.³ A23D *3/00;* **A23L** *1/23*

U.S. Cl. 426—98 **11 Claims**

1. Composition for providing natural butter flavor to a butter substitute spread, said composition comprising as a water soluble component starter distillate which is uniformly distributed through lipolyzed cream or lipolyzed butter oil as an oil soluble component in ratio of 2–20 parts of said oil soluble component per each part of said water soluble component.

4,414,230

PLASTIC CONTAINER IMPROVED IN BARRIER PROPERTIES AGAINST GASES AND WATER VAPOR

Makoto Hanabata, Takatsuki; Takashi Maruyama, Toyonaka, and Katsuji Ueno, Hirakata, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 238,132, Feb. 25, 1981, abandoned. This application Oct. 19, 1981, Ser. No. 312,867

Claims priority, application Japan, Apr. 2, 1979, 54-40029

Int. Cl.³ B65D *85/00;* **C08G** *63/00*

U.S. Cl. 426—106 **9 Claims**

1. A plastic container made from a thermoplastic resin composition comprising (A) an aromatic polyester carbonate composed of an aromatic dicarboxylic acid moiety, an aromatic dihydroxy compound moiety and a carbonate moiety and (B) at least one member selected from polyalkylene terephthalates and polyalkylene oxybenzoates, in a ratio of 100 parts by weight of (A) to 100 parts by weight or less of (B), said thermoplastic resin composition having improved barrier properties against gases and water vapor.

9. A plastic container made from a thermoplastic resin composition comprising (A) an aromatic polyester carbonate composed of an aromatic dicarboxylic acid moiety, an aromatic dihydroxy compound moiety and a carbonate moiety and (B) at least one member selected from polyalkylene terephthalates and polyalkylene oxybenzoates, in a ratio of 100 parts by weight of (A) to 100 parts by weight or less of (B), said thermoplastic resin composition having improved barrier properties against gases and water vapor, said container containing food or medicine.

4,414,231

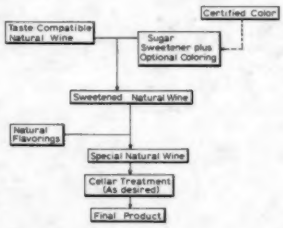
SPECIAL NATURAL WINES SIMULATIVE OF LIQUEURS

Vincent G. Ficca, Princeton Junction, N.J., assignor to Joseph E. Seagram & Sons, Inc., New York, N.Y.

Filed Apr. 20, 1981, Ser. No. 255,868

Int. Cl.³ C12H *1/04;* **C12G** *1/00*

U.S. Cl. 426—271 **5 Claims**



1. A special natural wine, simulative of a distilled liqueur, which comprises;

(A) a natural wine comprising an anion-exchanged sherry wine of reduced nut-like flavor, having a total acid content of from 0.25 to 0.35 gm/100 ml. as tartaric acid, a pH of 3.8 to 4.5 and from 20 to 24 percent by volume of alcohol; wherein said flavor reduction is accomplished by treating the sherry wine with lactic acid precipitated casein;

(B) a sweetener selected from the group consisting of corn syrup, corn syrup derivative sweeteners, invert sugar syrup and a liquid sugar of not less than 60 brix by weight in an amount sufficient to result in sweetening of the natural wine; and

(C) a natural flavoring in an amount sufficient to result in a flavoring of the natural wine; said special natural wine having an alcohol content of from 15 to 21 percent by volume, a solids content of from about 20 to 45 brix by

weight dealcoholized, a total acid content of 0.05 to 1.0 gms/100 ml. as tartaric acid and a pH of 3.5 to 5.5.

4,414,232

PROCESS FOR PREPARING COOKED BACON HAVING REDUCED LEVELS OF N-NITROSAMINES

Rhule B. Sleeth, Paradise Valley; Richard F. Theiler, and Robert B. Rendek, both of Scottsdale, all of Ariz., assignors to Armour and Company, Phoenix, Ariz.

Continuation-in-part of Ser. No. 158,679, Jun. 12, 1980, Pat. No. 4,315,948. This application Dec. 28, 1981, Ser. No. 335,039

The portion of the term of this patent subsequent to Feb. 16, 1999, has been disclaimed.

Int. Cl.³ A23B *4/00*

U.S. Cl. 426—266 **6 Claims**

1. A process for preparing cured bacon which, when cooked for consumption, contains substantially reduced levels of N-nitrosamines, said process comprising the steps of nitrite-curing, heat processing and slicing bacon bellies and then applying to the external surfaces of the resulting slices, after completion of said nitrite-curing and before cooking, a liquid smoke in concentration to provide 20 to 160 ppm phenols and 10 to 800 ppm carbonyl compounds, based upon the weight of the sliced bacon, the ratio of carbonyls to phenols being within the range of 0.5–5 to 1.

4,414,233

METHYLTHIOMETHYL ESTERS AS FLAVOR ADDITIVES

Steven van den Bosch, Woudenberg; Evert van't Land, Terschuur, and Jan Stoffelsma, Hoevelaken, all of Netherlands, assignors to Polak's Frutal Works, B.V., Amersfoort, Netherlands

Continuation-in-part of Ser. No. 231,184, Feb. 2, 1981, Pat. No. 4,332,829, which is a continuation-in-part of Ser. No. 52,154, Jun. 26, 1979, abandoned. This application Mar. 11, 1982, Ser. No. 357,012

Claims priority, application United Kingdom, Jul. 18, 1978, 30161/78

The portion of the term of this patent subsequent to Jun. 1, 1999, has been disclaimed.

Int. Cl.³ A23L *1/226, 1/235*

U.S. Cl. 426—535 **33 Claims**

1. A dairy flavoring composition or a dairy product flavor-enhancing composition containing at least one methylthiomethyl ester having the structural formula R—$COOCH_2$—SCH_3 wherein R is selected from the class consisting of hydrogen, alkyl radicals with 1 to 9 carbon atoms, alkenyl radicals with 2 to 9 carbon atoms, and polyunsaturated alkyl radicals with 4 to 9 carbon atoms; and at least one other flavoring compound selected from the class consisting of 2-methylbutyric acid, vanillin, maltol, ethyl butyrate, ethyl hexanoate, ethyl isovalerate, delta-decalactone, 2-heptanone, heliotropin, gamma-undecalactone, butyric acid, ethyl lactate, hexanoic acid, gamma-decalactone, gamma-dodecalactone, isovaleric acid, acetoin, octanoic acid and diacetyl.

17. A foodstuff to which has been added about 5 to 2000 parts per million, based on the total weight of said foodstuff, of at least one methylthiomethyl ester having the structural formula R—$COOCH_2SCH_3$ wherein R is selected from the class consisting of hydrogen, alkyl radicals with 1 to 9 carbon atoms, alkenyl radicals with 2 to 9 carbon atoms and polyunsaturated alkyl radicals with 4 to 9 carbon atoms.

4,414,234

NATURALLY COLORED OLEOMARGARINE

Baratham Sreenivasan, Paramus, and Kenneth S. Baker, Tenafly, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 107,745, Dec. 26, 1979, Pat. No. 4,304,792. This application Jun. 15, 1981, Ser. No. 273,538

Int. Cl.³ A23L *1/275*

U.S. Cl. 426—540 **2 Claims**

1. A natural food colorant for use with margarine packaged in wrappers, said colorant having a yellow color substantially identical with the color of commercial margarines where said commercial margarines are colored with β-carotene, said colorant comprising a mixture of:

A. a first edible material of natural origin which in use amounts does not detract from normal margarine flavor and having a predominately yellowish hue due primarily to carotenoid pigments with a greenish cast due to α-carotene, said first material being present in an amount sufficient to impart said yellowish hue with greenish cast to said margarine, and

B. a second edible material of natural origin which in use amounts does not detract from normal margarine flavor and having a predominately reddish hue, in an amount sufficient to negate the greenish cast of said first material and to produce said yellow color, said food colorant characterized by not substantially migrating from margarine containing said colorant to margarine wrappers in contact with said margarine.

4,414,235

PROCESS FOR PREPARING INSTANT MACARONIS

Shukuko Takekoshi, No. 39-1, Mitsuishi Aza-Minamiote, Naruto-cho, Naruto-shi, Tokushima, Japan (772)

PCT No. PCT/JP80/00190, § 371 Date Apr. 22, 1981, § 102(e) Date Apr. 15, 1981

PCT Filed Aug. 21, 1980, Ser. No. 253,839

Claims priority, application Japan, Aug. 22, 1979, 54-108270

Int. Cl.³ A23L *1/16*

U.S. Cl. 426—557 **5 Claims**

1. A process for preparing instant macaronis which comprises adding an aqueous solution of a carbonate as a first kneading water, an egg white and a yam to a wheat flour, said carbonate, egg white and yam being present in the amount of 0.2 to 0.4% by weight based on the dry weight of said wheat flour; half-kneading the resulting mixture; aging the half-kneading mixture; adding an aqueous solution of an edible acid as a second kneading water to the aged mixture and kneading it, said acid being present in the amount of 0.2 to 0.4% by weight based on the dry weight of said wheat flour; molding the mixture into a desired shape; boiling the obtained alimentary paste in a 2 to 4% by weight aqueous solution of common salt; surface-treating the resulting boiled alimentary paste with a solution of about 2 to 4% by weight of glucose dissolved in an alcohol-water mixed solvent; and freeze-drying the surface-treated alimentary paste.

4,414,236

EDIBLE EMULSIONS CONTAINING GELLING AGENTS

David P. J. Moran, Covington, and John J Hepburn, Harpenden, both of England, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 95,122, Nov. 16, 1979, abandoned. This application Jun. 17, 1981, Ser. No. 274,609

Claims priority, application United Kingdom, Nov. 16, 1978, 44799/78

Int. Cl.³ A23D *3/00, 5/00*

U.S. Cl. 426—573 **6 Claims**

1. Edible emulsions comprising a continuous fatty phase containing a plastic fat having a dilatation value at 10° C. of at least 150 and a dilatation value at 35° C. which does not exceed 50, and a dispersed aqueous phase in a weight ratio ranging

from 18-82 to 82-18, in which the aqueous phase is gelled with a gelling system of a softening point of at least 33° C., showing a sharp decrease in gel strength at a temperature ranging from 45° to 70° C., said gelled aqueous phase having a gel strength at a temperature below the softening point ranging from 0.1 to 30 N/cm^2 as measured by Instron apparatus using it in the linear compression test method.

4,414,237

PROCESS FOR PREPARING A SAUCE CONTAINING BREAD CRUMBS AND PRODUCT THEREOF

David N. Evans, Dover; Gary W. Jarvis, Hartly; Wayne L. Steensen, Newark, and Manoj Kumar O. Shah, Dover, all of Del., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 220,565, Dec. 29, 1980, abandoned. This application Sep. 20, 1982, Ser. No. 419,878

Int. Cl.³ A23L *1/22*

U.S. Cl. 426—589 **8 Claims**

1. A process for preparing a sauce having a pulpy texture wherein the improvement comprises:

(a) blending together sauce ingredients, wherein the sauce ingredients comprise bread crumbs, said bread crumbs consisting of from about 1 to about 10% of the sauce, based on the weight of the sauce, wherein said bread crumbs act as pulp-simulating particles, and said bread crumbs have a porous, elongated, and striated shape and structure, a particle size distribution such that the bread crumbs pass through a USS 16 mesh screen but are retained on a USS 60 mesh screen, and consist essentially of wheat flour, yeast and salt;

(b) cooking said sauce in a heat exchanger, wherein said ingredients are held in the heat exchanger for a period of time effective to cook said sauce;

(c) cooling said cooked sauce; and

(d) bottling the sauce.

4,414,238

LIQUID ELEMENTAL DIET

Mary K. Schmidl, Emeryville, Calif., assignor to Cutter Laboratories, Inc., Berkeley, Calif.

Filed Dec. 24, 1981, Ser. No. 334,278

Int. Cl.³ A23D *5/00;* **A23J** *3/00;* **A23L** *1/00*

U.S. Cl. 426—602 **2 Claims**

1. A ready-to-use aqueous elemental diet composition comprising, based on the total calories of the composition, a carbohydrate component ranging in amount from about 50 to 90%, an amino acid component ranging in amount from about 5 to 30%, and a lipid component ranging in amount from 10 to 50%, the composition being non-browning at 38° C., having a pH ranging from about 3.0 to about 4.4 and having the lipid component in the form of a stable emulsion consisting of lipids, an emulsifier selected from the group consisting of mono and diglycerides and a corn starch modified with succinate anhydride in quantities sufficient to maintain emulsion stability in the pH range of about 3.0 to 4.4.

4,414,239

TOPPING COATING

Judith L. Oven, Banbury, England, assignor to General Foods Limited, Banbury, England

Filed Feb. 16, 1982, Ser. No. 348,909

Int. Cl.³ A23G *3/00*

U.S. Cl. 426—607 **13 Claims**

1. A dessert composition which is pourable at 19° C. but hardens to a smooth, brittle, edible coating when applied to a frozen dessert consisting essentially of from 50% to 65% by weight of a mixture of non-hydrogenated and non-fractionated vegetable oil having a solids index from 20% to 30% at 0° C. and not more than 4% at 19° C. wherein a major proportion of said mixture melts below 5° C. and a minor proportion melts above 20° C.; from 10% to 35% by weight a finely-divided sugar; and from 5% to 20% by weight of a dried milk powder.

4,414,240

PROCESS FOR LOWERING THE THERMOGELATION TEMPERATURE OF EGG ALBUMEN

Chang R. Lee, Yonkers, N.Y., assignor to Nutrisearch Company, Cincinnati, Ohio

Continuation of Ser. No. 95,685, Nov. 19, 1979, abandoned. This application Aug. 3, 1981, Ser. No. 290,265

Int. Cl.³ A23B *5/00;* **A23L** *3/00*

U.S. Cl. 426—614 **6 Claims**

1. A process for producing egg albumen having improved thermogelation properties consisting essentially

(1) heating an alkaline egg albumen solution to a temperature ranging from about 60° C. to the thermogelation temperature of the egg albumen, said solution having a pH ranging from about 8 to about 10 and a content of protein soluble within said pH range of less than about 20 percent,

(2) cooling the resulting heated solution to a temperature below at least 55° C. but not below 2° C. at a rate sufficient to avoid gelation of said solution and with sufficient agitation to insu[illegible] uniform cooling throughout said solution, said cooling being initiated within less than 30 seconds after said solution has been heated to the temperature recited in step (1),

said solution during heating step (1) and cooling step (2) not being at a temperature greater than 55° C. for a period of time greater than 1 minute, and

(3) adjusting the pH of the solution to about 6 to about 8 simultaneously with or subsequent to cooling in step (2).

4,414,241

METHOD FOR LUBRICATING BEARING AND GEAR SURFACES

Ferdinand Quella, Gauting, and Eugen Hohmann, Bensheim, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 29, 1982, Ser. No. 343,863

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1981, 3106184

Int. Cl.³ B05D *1/36*

U.S. Cl. 427—2 **19 Claims**

1. In a method of lubricating sliding/moving surfaces such as bearings, hand and angle pieces, high-speed turbine bearings and the like, the improvement comprising:

applying a film of a poly (fluoroacrylic acid methyl ester) polymer out of a solution containing about 0.1 through 10% by weight of said polymer to the lubricating surface so as to attain a laye thickness of about 0.5 through 10 μm of said polymer on said lubricating surface; and

thereafter lubricating the resultant surfaces with a polar oil exhibiting high lubricity.

4,414,242

PROCESS FOR FABRICATING A SEMICONDUCTOR DEVICE

Tadashi Nishimura, Hyogo, and Yoji Mashiko, Takarazuka, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 24, 1982, Ser. No. 444,095

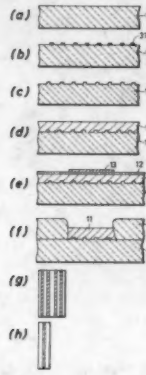
Claims priority, application Japan, Nov. 26, 1981, 56-190228

Int. Cl.³ B05D *3/06;* **H01L** *21/263*

U.S. Cl. 427—43.1 **8 Claims**

1. A process for producing a semiconductor device, comprising; forming an island of a polycrystalline or amorphous

semiconductor layer on, and surrounding the same by, an insulator, locally heating said layer to fuse the same to form a



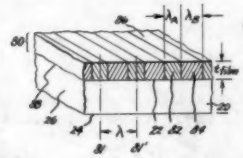
recrystallized structure and forming at least one ridge on the underlying insulator before the formation of said layer.

4,414,243

METHOD FOR MAKING SURFACE ACOUSTIC WAVE DEVICES

Harvey E. Cline, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 6, 1982, Ser. No. 395,778
Int. Cl.³ B05D 5/12
U.S. Cl. 427—100 **14 Claims**



8. A method for making surface acoustic wave devices comprising the steps of:

(a) providing a body of piezoelectric material, said body having substantially parallel major surfaces and a peripheral edge area interconnecting said major surfaces;

(b) forming a thin film lamellar metallic eutectic on at least a portion of one of said major surfaces of said body;

(c) selectively removing one of the phases of said thin film lamellar metallic eutectic, forming thereby a first spaced array of substantially parallel metallic elements;

(d) forming a first interconnect to electrically connect said metallic elements of said first spaced array, forming thereby a first comb-like structure;

(e) applying a layer of an insulating material over the exposed surfaces of said first comb-like structure;

(f) selectively masking the top surface of said first interconnect;

(g) depositing a substantially continuous layer of a conducting material over the insulated first comb-like structure filling thereby the spaces between the insulated elements of said first spaced array;

(h) preferentially removing segments of the deposited conducting material from above the insulated metallic elements of said first spaced array to form a second spaced array of metallic elements substantially juxtaposed from said insulated metallic elements of said first spaced array;

(i) selectively masking the top surface of said first and second spaced arrays;

(j) forming a second interconnect to electrically connect said metallic elements of said second spaced array, forming thereby a second comb-like structure interdigitated with and electrically insulated from said first comb-like structure; and

(k) removing the masking material and metal deposited thereon from the top surface of said first interconnect and from the top surface of the first and second spaced arrays.

4,414,244

SURFACE MODIFICATION TO WAVEGUIDES

John R. Timberlake, Allentown; David N. Ruzic, Kendall Park; Richard L. Moore, Princeton; Samuel A. Cohen, Pennington, and Dennis M. Manos, Lawrenceville, all of N.J., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Jun. 16, 1982, Ser. No. 388,873
Int. Cl.³ B05D 7/22, 3/14, 3/02
U.S. Cl. 427—105 **9 Claims**

1. A method of treating the interior surfaces of a waveguide comprising the steps of:

(a) mechanically polishing the interior waveguide surfaces to remove surface protrusions;

(b) electropolishing the interior waveguide surfaces with an electrolyte to produce an electrochemically flat surface;

(c) ultrasonically cleaning the interior waveguide surfaces with a solvent to remove any residue;

(d) applying a 1μ–5μ thick film of an alkyd resin solution to the interior waveguide surfaces; and

(e) vacuum pyrolyzing said film to form a carbon coating.

4,414,245

PROCESS FOR PRODUCING COBALT CONTAINING FERROMAGNETIC IRON OXIDES

Kokichi Miyazawa, Suzuka; Kazuo Nakata, Moriyama; Tsuneo Ishikawa, Moriyama; Ichiro Honma, Moriyama; Arata Koyama, Moriyama, and Masatoshi Amano, Moriyama, all of Japan, assignors to Ishihara Sangyo Kaisha, Ltd., Osaka, Japan

Filed Jul. 23, 1982, Ser. No. 401,214
Claims priority, application Japan, Jul. 28, 1981, 56-117945; Oct. 7, 1981, 56-159620; Nov. 20, 1981, 56-186453; Dec. 15, 1981, 56-201958
Int. Cl.³ C01G 49/06; B05D 5/12
U.S. Cl. 427—127 **8 Claims**

1. A process for producing a cobalt containing ferromagnetic iron oxide, which comprises treating magnetic iron oxide particles with a cobalt salt solution and an alkali or with a cobalt salt solution, a ferrous salt solution and an aklali to coat a cobalt compound or a cobalt compound and a ferrous compound on the surface of the particles the alkali being present at least in an amount equivalent to the cobalt salt or the cobalt and ferrous salts, the amount of cobalt coated being about 0.5–30% by weight based on the iron oxide, the amount of ferrous iron coated being about 1–30% by weight based on the iron oxide and said treating being effected in a non-oxidative atmosphere; separating the coated particles from the dispersion containing them and then heating the coated particles at a temperature of 60°–300° C. in an atmosphere in which the partial pressure of water vapor is at least 0.2 atm., said cobalt containing ferromagnetic iron oxide exhibiting a higher coercivity than a cobalt containing ferromagnetic iron oxide prepared as above absent said heating at a temperature of 60°–300° C. in an atmosphere in which the partial pressure of water vapor is at least 0.2 atm.

4,414,246

METHOD FOR PROTECTING ENVIRONMENT FROM VOLATILE LIQUID CHLORIDE AS EXPOSED TO THE ATMOSPHERE

Hiroshi Ishizuka, 19-2, Ebara 6-chome, Shinagawa-ku, Tokyo, Japan

Filed May 3, 1982, Ser. No. 373,875
Claims priority, application Japan, May 13, 1981, 56-71797
Int. Cl.³ B05D 7/00
U.S. Cl. 427—222 8 Claims

1. A method for protecting the environment from volatile liquid metal chloride exposed to the atmosphere, which comprises:

spreading foamy particulates of styrene resin over the chloride, and

permitting a reaction to occur between the resin and chloride at the interface to form a filmy reaction product which covers the surface of the chloride to a substantial degree, thus blocking evaporation of the chloride to prevent it from spreading and contacting the humidity in the atmosphere.

4,414,247

METHOD FOR SURFACE TREATMENT OF THREADING

Hans Hübecker; Friedrich Lenze, both of Düsseldorf, and Gerhard Missaire, Ruppichteroth, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Mar. 29, 1982, Ser. No. 363,297
Claims priority, application Fed. Rep. of Germany, Jan. 11, 1982, 81730042
Int. Cl.³ B05D 7/22, 3/12, 3/02
U.S. Cl. 427—230 1 Claim

1. The method of treating load-bearing surfaces of oil field tubes, casings, and the like, comprising the steps of

blasting the surfaces for increasing the roughness thereof in order to obtain a roughness of an average depth of from 7 micrometers to 15 micrometers, and under utilization of corundum or silicon carbide at a grain size of from 40 micrometers to 200 micrometers;

depositing a synthetic resin varnish onto the blasted surfaces, the varnish curing at a higher than room temperature and including molybdenum sulfide, the varnish being deposited at a layer thickness of from 5 micrometers to 20 micrometers; and

curing the deposited varnish by heating.

4,414,248

METHOD FOR THE STRIPING OF THE INSIDE SEAM OF A CAN BODY MOVING AT A HIGH SPEED

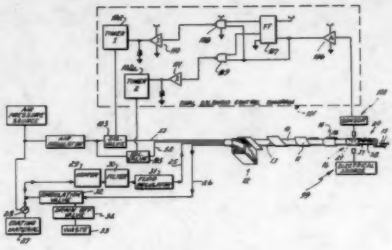
James A. Kollbas, Cleveland, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Division of Ser. No. 245,939, Mar. 20, 1981, Pat. No. 4,353,326. This application Jun. 7, 1982, Ser. No. 386,003
Int. Cl.³ B05B 12/04, 12/02; B05D 7/22, 1/02
U.S. Cl. 427—236 3 Claims

1. A method of applying coating material onto the inside of consecutive can bodies moving along a can forming line comprising:

applying coating material from a first spray coating means onto the inside of alternate can bodies moving past said first spray coating means along the can forming apparatus; and

applying coating material from a second spray coating means onto the inside of alternate can bodies following



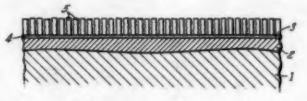
those to which coating material was applied by said first spray coating means.

4,414,249

METHOD FOR PRODUCING METALLIC ARTICLES HAVING DURABLE CERAMIC THERMAL BARRIER COATINGS

Nicholas E. Ulion, Marlborough, and Duane L. Ruckle, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 109,955, Jan. 7, 1980, Pat. No. 4,321,310. This application Dec. 4, 1981, Ser. No. 327,377
Int. Cl.³ C23C 11/00, 13/00
U.S. Cl. 427—248.1 12 Claims



1. A method for producing a metallic article having a durable ceramic thermal barrier coating said method consisting essentially of:

a. providing a superalloy substrate with a clean surface

b. applying a thin adherent layer of MCrAlY to the clean surface

c. polishing the MCrAlY layer to a smoothness of less than about 25 microinches RMS

d. applying a columnar ceramic coating to the polished MCrAlY layer by vapor deposition

e. heat treating the columnar ceramic coated article in a oxygen containing atmosphere to develop an alumina layer between the MCrAlY and the columnar ceramic coating.

4,414,250

AMINE CONTAINING RESIN WITH OXALATE ESTERS FOR CASTING

John R. Costanza, North Plainfield, and Louis E. Trapasso, Watchung, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Oct. 2, 1981, Ser. No. 308,064
Int. Cl.³ B05D 3/02
U.S. Cl. 427—386 13 Claims

4. A method for protecting a surface with a crosslinked resinous coating which comprises admixing an oxalate ester with polyethyleneimine polyamine and casting the admixture on said surface at ambient temperatures; said oxalate ester corresponding to the formula:

$$RO_2C—CO_2R$$

wherein R is a lower alkyl group containing between one and about four carbon atoms.

4,414,251

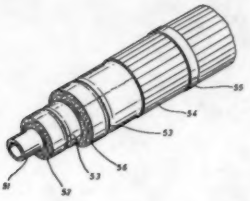
METHOD FOR MOISTURE-PROOFING REFRACTORY FIBER FOR USE IN FIRE-RESISTANT ENCLOSURES

Thomas W. Palmer, 2907 Del Monte Ct., Missouri City, Tex.

Division of Ser. No. 80,884, Oct. 1, 1979, Pat. No. 4,307,813. This application Jul. 31, 1981, Ser. No. 288,879

Int. Cl.³ B05D *1/36, 7/00;* **C08H** *9/08;* **C08J** *3/02*

U.S. Cl. 427—407.1 **1 Claim**



1. A method for moisture-proofing refractory fiber material comprising

emulsifying paraffin in water,

applying the emulsion to the refractory fiber material,

drying the refractory fiber material after the emulsion has been applied, and

coating the refractory fiber material with at least one coat of vinyl mastic paint.

4,414,252

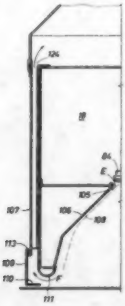
SPRAY FORMING THIN FILMS

Curtis M. Lampkin, El Paso, Tex., assignor to Photon Power, Inc., El Paso, Tex.

Continuation of Ser. No. 209,724, Nov. 24, 1980, abandoned. This application May 24, 1982, Ser. No. 381,291

Int. Cl.³ B05D *1/02;* **B05B** *1/04*

U.S. Cl. 427—424 **25 Claims**



23. A spray process for forming thin films of selected materials on a hot moving substrate, comprising:

forming from an atomized liquid a selected spray configuration within a spray chamber;

projecting said spray toward said hot substrate;

introducing atmospheric flow about said spray in an amount effective to suppress convection currents above said hot substrate;

removing a first portion of said atmospheric flow through an intermediate slot within said spray chamber at an elevation remote from said substrate; and

exhausting a second portion of said atmospheric flow from above said substrate.

4,414,253

METHOD FOR APPLYING LIQUID PLASTICIZER TO FILAMENTARY FILTER MATERIAL

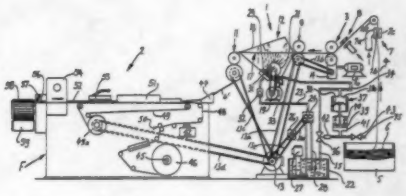
Peter Grumer, Tespe; Wolfgang Wiese, Hamwarde, and Günter Serrin, Buchholz, all of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Division of Ser. No. 269,976, Jun. 3, 1981, Pat. No. 4,368,688. This application Sep. 28, 1982, Ser. No. 425,472

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1980, 3023001

Int. Cl.³ A24D *3/00*

U.S. Cl. 427—424 **7 Claims**



1. A method of applying liquid plasticizer to a foraminous running tow of filamentary filter material, comprising the steps of establishing and maintaining a treating zone; conveying the tow into, through and from said zone at a variable speed; conveying into said zone atomized liquid plasticizer at a first rate such that successive increments of the tow which leave said zone entrain the admitted plasticizer as soon as said zone accumulates a quantity of residual plasticizer; interrupting at least one of said conveying steps; withdrawing at least some residual plasticizer from said zone on interruption of said one conveying step; resuming said one conveying step; conveying the plasticizer at a higher second rate on resumption of said one conveying step so as to restore said quantity of residual plasticizer; and thereupon again proceeding with conveying of plasticizer at said first rate.

4,414,254

SELECTIVE LIGHT-TRANSMITTING LAMINATED STRUCTURE

Kaoru Iwata; Toshio Nishihara, both of Hachioji; Michisuke Ohe; Yoichi Saito, both of Hino, and Akihiro Horike, Mihara, all of Japan, assignors to Teijin Limited, Osaka, Japan

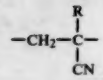
Filed Dec. 23, 1981, Ser. No. 333,774

Claims priority, application Japan, Dec. 26, 1980, 55-183725; Dec. 29, 1980, 55-185293; Feb. 12, 1981, 56-17963

Int. Cl.³ E06B *3/24;* **B32B** *27/40*

U.S. Cl. 428—34 **17 Claims**

1. In a selective light-transmitting laminated structure comprising (a) a laminate composed of a transparent substrate and formed on at least one surface of the substrate, a thin metallic layer having a thickness of 30–500 Å if required in combination with a thin film layer having a high refractive index, and (b) a protective layer coated on said laminate (a) and composed mainly of a polymer having structural units of the general formula



(I)

wherein R represents a hydrogen atom or a methyl group, as main structural units, the improvement wherein the corrosion resistance of said structure is improved by providing a urethan linkage in the interface between the laminate (a) and the protective layer (b).

4,414,255

WATER ABSORBING SHEET ASSEMBLY

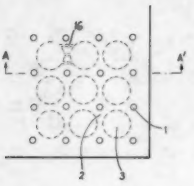
Mitsuru Tokuyama; Yoshimi Tsuchiya; Hikotaro Kawaguchi, all of Utsunomiya; Masayuki Sagae, Ichikaimachi, and Kenji Ohki, Chiba, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Apr. 18, 1980, Ser. No. 141,742

Claims priority, application Japan, May 9, 1979, 54-56562

Int. Cl.³ B32B *3/28, 29/00*

U.S. Cl. 428—154 **5 Claims**



1. A laminated, water-absorbing, sheet assembly comprising two sheets and a layer of polymeric absorbent powder interposed between said two sheets, at least one of said sheets being a water-permeable, creped sheet, said sheet assembly being embossed in a pattern such that said sheet assembly consists essentially of first areas in which said sheets are deeply embossed and strongly press-bonded to each other, second areas in which said sheets are shallowly embossed and weakly press-bonded to each other and third areas in which said sheets are not embossed and not press-bonded to each other, said third areas being continuous to and communicating with each other, and the area ratio of press-bonded areas of said sheets to non-press-bonded areas of said sheets being in the range of from 1:0.05 to 1:4.

4,414,256

CHEMICALLY WETTED FILM OF METAL PHASE ON GRAPHITE AND PROCESS FOR PREPARING SAME

Rexford D. Sherwood, Suffern, N.Y.; Rees T. K. Baker, Murray Hill, N.J.; Eric G. Derouane, Namur, Belgium, and Wim J. M. Pieters, Morristown, N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jan. 5, 1981, Ser. No. 222,644

The portion of the term of this patent subsequent to Feb. 2, 1999, has been disclaimed.

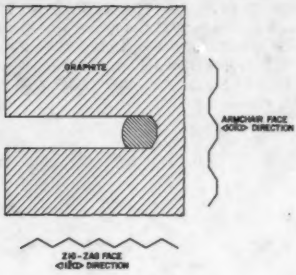
Int. Cl.³ B01J *21/18*

U.S. Cl. 428—163 **8 Claims**

1. A composition of matter comprising a film of chemically wetted metal phase on graphite wherein said metal is selected from the group consisting essentially of Ni, Co, Mo and mixtures thereof and wherein said film is formed by:

(a) contacting a composite of said metal and graphite with a net-reducing, hydrogen-containing atmosphere at a temperature of from about 800°–975° C. for a time sufficient for said metal to form a plurality of metal-containing channels in said graphite; and

(b) contacting said metal-containing, channeled composite formed in (a) with a net-reducing, hydrogen-containing atmosphere at a temperature above about 975° C. for a time sufficient for said metal in said channels to spread out and chemically wet at least a portion of the surface of said channels as a thin film of said metal phase.



3. A composition of matter comprising a film of chemically wetted metal phase on graphite, said metal film being on the surface of channels formed in said graphite by the catalytic gasification thereof, wherein said channels are parallel to the a-face of the graphite and wherein said metal is selected from the group consisting essentially of nickel, cobalt, molybdenum, and mixtures thereof.

4,414,257

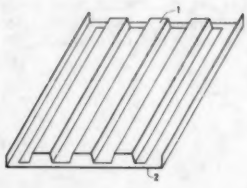
ELEVATOR PANEL

Kousuke Haraga, Hyogo, and Katsutoshi Hattori, Aichi, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha and Denki Kagaku Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Jul. 9, 1981, Ser. No. 281,626

Int. Cl.³ B32B *3/28*

U.S. Cl. 428—182 **4 Claims**



1. A panel for an elevator comprising: a surface plate, and a corrugated reinforcing member having ridges facing said surface plate, said surface plate and said corrugated reinforcing member being joined to each other by a room temperature curing acrylate adhesive of a two-part non-solvent type applied in flat layers in an unmixed condition to entire crests of said ridges and surface portions of said surface plate facing said ridges.

4,414,258

TURN-UP TAPE

James R. Corbin, Sr., P.O. Box 789, Millbrook, Ala. 36054

Filed Oct. 6, 1981, Ser. No. 309,063

Int. Cl.³ B32B *7/00*

U.S. Cl. 428—193 **10 Claims**

1. A turn-up tape for severing a travelling web of paper comprising

a repulpable paper ribbon having at least one cutting edge for severing a travelling web of paper; and

means secured to one end of said ribbon for attaching said ribbon end to a rotating reel spool, said means having at least

one adhesive layer and a release layer covering said adhesive layer.

4,414,259

HEAT-SENSITIVE RECORD MATERIAL

Hiroshi Tsuchiya, Hino; Hitoshi Yamahira, Takatsuki, and Takeshi Murakami, Osaka, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Hyogo, Japan

Continuation of Ser. No. 151,759, May 20, 1980, abandoned. This application Jun. 28, 1982, Ser. No. 392,809

Claims priority, application Japan, May 23, 1979, 54-64203

Int. Cl.³ B32B *5/16*

U.S. Cl. 428—207 **6 Claims**

1. In a heat-sensitive record material comprising a base sheet and a color developing layer formed on at least one surface of said base sheet, said color developing layer comprising color former and acceptor which is reactive with said color former to develop a color, the improvement in said color developing layer including oil absorptive pigment having an oil absorption larger than 80 ml/100 g and inorganic pigment having an average particle size within the range of 6 to 15 microns, said oil absorptive pigment being a member selected from the group consisting of diatomaceous earth, calcined diatomaceous earth, flux calcined diatomaceous earth, finely divided aluminium oxide anhydride, finely divided titanium oxide, magnesium cabonate, white carbon, finely divided silicon dioxide, magnesium aluminosilicate and mixtures of the foregoing, said inorganic pigment being a member selected from the group consisting of calcium carbonate, aluminium hydroxide, aluminum oxide, talc, calcined clay and mixtures of the foregoing, and said color developing layer having a surface roughness of an Ra smaller than 1.2 microns and a gloss smaller than 25%.

4,414,260

STATIC DISSIPATIVE UPHOLSTERY FABRIC OR THE LIKE

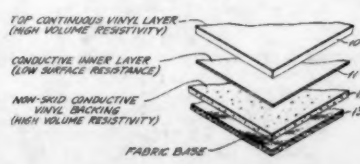
Ray M. Rzepecki, North Scituate, R.I., and Victor H. Weiss, Bridgeport, Conn., assignors to Pervel Industries, Inc., Plainfield, Conn.

Continuation-in-part of Ser. No. 243,776, Mar. 16, 1981, Pat. No. 4,363,071. This application Aug. 19, 1982, Ser. No. 409,599

The portion of the term of this patent subsequent to Dec. 7, 1999, has been disclaimed.

Int. Cl.³ B32B *27/06, 27/18, 27/30*

U.S. Cl. 428—212 **8 Claims**



1. As an article of manufacture, for lamination to a fabric base in the manufacture of static-dissipative upholstery material or the like, a multi-layer conductive web for dissipating a static electric charge impressed thereon, said web comprising an upper layer of thermoplastic polymeric material having a volume resistivity of 1×10^7 to 1×10^{12} ohm-cm, a continuous thin conductive film of thermoplastic polymeric material in direct physical and electrical connection with the underside of said upper layer and having a surface resistance in the order of 10^2 ohms per square, and a conductive underlying lower layer in electrical contact with the underside of said conductive film, said underlying layer being a layer of expanded thermoplastic polymeric material having a volume resistivity of 1×10^7 to 1×10^{12} ohm-cm.

4,414,261

ADHESIVE TAPE

Kazuhiko Nanbu, Nagahama, Japan, assignor to Mitsubishi Plastics Industries Limited, Tokyo, Japan

Filed Sep. 14, 1982, Ser. No. 417,879

Claims priority, application Japan, Oct. 27, 1981, 56-171582

Int. Cl.³ B32B *7/02;* **C09J** *7/02*

U.S. Cl. 428—213 **13 Claims**

1. An adhesive tape which comprises a base sheet and an adhesive layer coated on one side of the base sheet, characterized in that said base sheet comprises an intermediate layer made of a crystalline polypropylene containing from 25 to 35% by weight of a petroleum resin and outer layers made of a crystalline polypropylene laminated on both sides of the intermediate layer, said intermediate layer having a thickness within a range of from 60 to 90% of the total thickness of the base sheet and the layers of the base sheet being biaxially oriented so that the orientation in the longitudinal direction is greater than the orientation in the transverse direction.

6. The adhesive tape according to claim 1 wherein the base sheet has a thickness of from 30 to 40μ and the adhesive layer has a thickness of from 15 to 25μ.

4,414,262

SHAPED BODY OF A SETTABLE MINERAL MATERIAL WITH REINFORCEMENT FIBERS EMBEDDED THEREIN

Ludwig Hartmann, Kaiserslautern, and Otto Ambros, Mannheim, both of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Jul. 15, 1982, Ser. No. 398,311

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1981, 3142598

Int. Cl.³ D03D *13/00*

U.S. Cl. 428—222 **10 Claims**

1. A shaped body comprising a nonwoven fabric of endless reinforcement fibers embedded in an alkaline settable mineral material the endless fibers having no preferred direction or orientation, and said fibers being comprised of a bundle of individual parallel fiber strands, wherein at least one fiber strand at the core of the bundle is protected against chemical interaction with said alkaline settable material by the outermost fiber strands of said bundle which are comprised of a polymeric material which is inert to the alkaline settable material.

4,414,263

PRESS FELT

Joseph S. Miller, and Ronald L. Aylor, both of Atlanta, Ga., assignors to Atlanta Felt Company, Inc., Battlecreek, Ga.

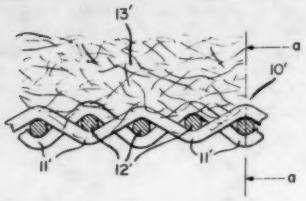
Filed Jul. 9, 1982, Ser. No. 396,626

Int. Cl.³ B32B *5/00*

U.S. Cl. 428—234 **6 Claims**

1. A press felt being in the shape of an endless belt and having opposed side edges, said felt having a lateral direction extending between the side edges thereof and a longitudinal direction extending perpendicularly to said lateral direction, said felt comprising an open-mesh base fabric woven of a plurality of synthetic filaments extending in both the lateral and longitudinal directions, and at least one batt of stable fibers

needled thereto, characterized in that at least some of the filaments extending in the lateral direction are monofilaments



having a flattened cross-section, the long axis of which lies parallel to the plane of the fabric.

4,414,264

CHIP CARRIER SUBSTRATES OF HYBRID WOVEN GLASS CLOTHS

Larry D. Olson, Viroqua, Wis., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 334,500, Dec. 28, 1981, Pat. No. 4,372,347. This application Jan. 13, 1983, Ser. No. 457,778

Int. Cl.³ B32B *5/16*

U.S. Cl. 428—241 **10 Claims**

1. The application of a substrate for carrying a silicon chip (integrated circuits) which comprises a hybrid glass cloth woven from yarn comprising fiberglass and a second material which possesses a coefficient of thermal expansion of less than about 5.0×10^{-6} in/in/°C.

4,414,265

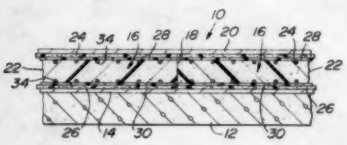
INSULATION BOARD

Dennis W. Rosato, Lawrenceville, and Neil K. Lister, Rahway, both of N.J., assignors to Millmaster Onyx Group, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 390,249, Jun. 21, 1982, Pat. No. 4,388,366. This application Mar. 10, 1983, Ser. No. 474,153

Int. Cl.³ B32B *17/10, 5/18, 5/32*

U.S. Cl. 428—285 **12 Claims**



1. An insulation board comprising a plastic foam layer covered by at least one facing panel, said panel comprising a facing sheet, said facing sheet comprising glass fibers which are randomly dispersed in uniform fashion throughout the sheet, said fibers being bonded together by a bonding agent, and said fibers and bonding agent being coated by a non-wicking agent to provide a porous but liquid-repellent structure, said panel also including a scrim, said scrim being positioned between the facing sheet and the foam layer, the scrim comprising a glass fiber mat wherein the fibers are randomly dispersed and bonded together by a bonding agent, and wherein a pattern of glass strands are bonded to at least one face of the mat.

4,414,266

METHOD OF MANUFACTURE OF REINFORCED SHEET PLASTICS MATERIAL AND THE PRODUCTION OF MOULDED ARTICLES THEREFROM

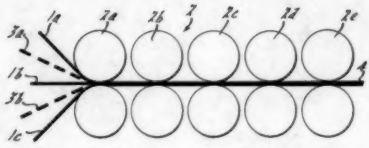
Emmit W. Archer, Ann Arbor, Mich., and Derek F. Gentle, Danbury, England, assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 19, 1980, Ser. No. 179,618

Claims priority, application United Kingdom, Aug. 24, 1979, 7929582

Int. Cl.³ B32B *27/36*

U.S. Cl. 428—287 **22 Claims**



1. A method of manufacturing a reinforced sheet material which comprises holding superimposed layers of fibrous reinforcing material and molten polyethylene terephthalate, in contact under pressure, and cooling the superimposed layers to below the glass transition point of the polyethylene terephthalate, the cooling being effected at a rate sufficient to avoid crystallization of the polyethylene terephthalate.

4,414,267

METHOD FOR TREATING DISCONTINUOUS CELLULOSE FIBERS CHARACTERIZED BY SPECIFIC POLYMER TO PLASTICIZER AND POLYMER-PLASTICIZER TO FIBER RATIOS, FIBERS THUS TREATED AND COMPOSITES MADE FROM THE TREATED FIBERS

Aubert Y. Coran, and Lloyd A. Goettler, both of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed Apr. 8, 1981, Ser. No. 252,514

Int. Cl.³ B32B *23/02, 23/08*

U.S. Cl. 428—288 **15 Claims**

1. The process of treating discontinuous cellulose fibers by slurrying said fibers in water, contacting said fibers with a mixture of (a) an aqueous suspension of a vinyl chloride polymer in which suspension the polymer has a particle diameter of 10μm or less and (b) a plasticizer for said polymer, causing the polymer and plasticizer to deposit on the fibers, and drying the treated fibers, wherein the polymer and plasticizer together are present in an amount of at least 25 parts per 100 parts of fiber by weight, and the weight ratio of plasticizer to polymer in the mixture is from 2.5:1 to 25:1.

13. Treated fibers produced by the process of claim 1.

14. A composite containing treated fibers of claim 13 dispersed in a matrix which comprises vinyl chloride polymer.

4,414,268

ABSORBENT MICROBIOCIDAL FABRIC AND PROCESS FOR MAKING SAME

A. Frank Baldwin, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

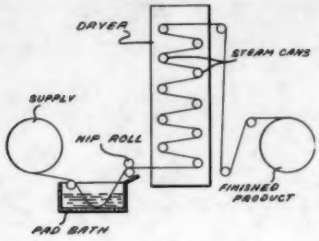
Filed Oct. 9, 1981, Ser. No. 310,414

Int. Cl.³ A61F *13/00*

U.S. Cl. 428—289 **3 Claims**

1. An absorbent, bioactive, highly wettable non-woven cellulosic medical substrate having incorporated thereon a non-leachable, bioactive amount of 3-(trimethoxysilyl)-propyloctadecyl dimethyl ammonium chloride present in an amount from about 0.15% to about 1.05% on the basis of the

weight of the substrate; and, as a wettable hydrophilic coupling agent, an organosilicone terpolymer of the formula:



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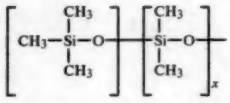

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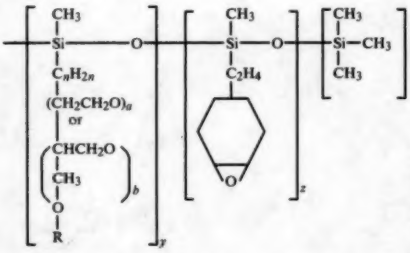


wherein R is hydrogen or methyl, the sum of a+b is in the range of 5 to 200, x is 10 to 50,000, y is 1 to x and z is 1 to 0.5x provided that the sum of y+z is $\leqq$0.75x; said terpolymer is present in an amount of from about 0.25% to about 1.25% on the basis of the weight of the substrate,

wherein the bioactive material and the hydrophilic coupling agent are substantively attached to the fibers of the cellulosic substrate, such that the bioactive compound and the hydrophilic coupling agent are substantially non-leachable from the substrate.

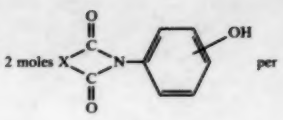
4,414,269

SOLVENT RESISTANT POLYSULFONE AND POLYETHERSULFONE COMPOSITIONS

Hyman R. Lubowitz, Rolling Hills Estates, Calif., and Clyde H. Sheppard, Bellevue, Wash., assignors to TRW, Inc., Redondo Beach, Calif. and The Boeing Company, Seattle, Wash.

Filed Jun. 16, 1981, Ser. No. 274,162
Int. Cl.³ C08G *73/12*
U.S. Cl. 428—290 **10 Claims**

1. A cross-linkable polysulfone or polyethersulfone polymer formed by reacting:

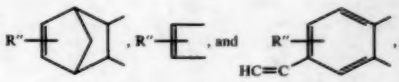


(1)

n + 1 moles Z—R—Z and (2)

n moles OH—R′—OH, (3)

wherein X is selected from the group consisting of



R″ is hydrogen or a lower alkyl, Z is selected from the group consisting of fluorine, chlorine, and bromine, R is an aromatic radical, R′ is an aromatic radical, at least one of said aromatic radicals R and R′ contains a diaryl radical wherein the aryl rings are connected by a sulfone linkage, and n is selected so that said polymer has a molecular weight between about 1,000 and about 40,000.

4,414,270

MAGNETIC RECORDING MEDIUM

Takahito Miyoshi; Toshimitu Okutu; Goro Akashi; Tatsuji Kitamoto, and Masaaki Fujiyama, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 2, 1982, Ser. No. 345,121
Claims priority, application Japan, Feb. 2, 1981, 56-14032
Int. Cl.³ B32B *5/16*
U.S. Cl. 428—325 **6 Claims**

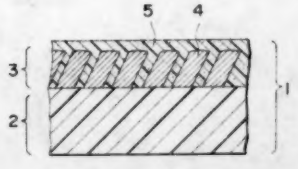
1. A magnetic recording medium comprising a magnetic layer on one surface of a non-magnetic base and a back coating on the other surface thereof which is not thicker than 2μ and which comprises inorganic particles and binder, wherein the inorganic particles are selected from the group consisting of tungsten disulfide, molybdenum disulfide, boron nitride, SiO_2, $CaCO_3$, Al_2O_3, Fe_2O_3, TiO_2, MnO, ZnO, CaO, and SnO_2 and have an average size between 0.02 and 0.5μ and a Mohs hardness of 2.5 to 9.0, and the surface of the back coating has a center line average roughness (Ra) of 0.024μ or less and the surface of the magnetic layer has a center line average roughness (Ra) of 0.02μ or less.

4,414,271

MAGNETIC RECORDING MEDIUM AND METHOD OF PREPARATION THEREOF

Tatsuji Kitamoto; Ryuji Shirahata; Yasuyuki Yamada, and Goro Akashi, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Feb. 25, 1982, Ser. No. 352,220
Claims priority, application Japan, Feb. 27, 1981, 56-28196
Int. Cl.³ B32B *5/16*
U.S. Cl. 428—328 **21 Claims**



1. A magnetic recording medium comprising a substrate, a

thin ferromagnetic metal film having spaced-apart columnar grain structures formed on said substrate, and a crosslinked organic polymer formed from a polymerizable organic compound and a curing agent at least in the spaces between said columnar grain structures and integrated with said thin ferromagnetic metal film.

4,414,272

SHAPED POLYESTER COMPOSITE MATERIAL HAVING ACTIVATED SURFACE THEREOF AND PROCESS FOR PRODUCING THE SAME

Hirosuke Watanabe, and Tadahiko Takata, both of Ibaraki, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Sep. 16, 1981, Ser. No. 302,856

Claims priority, application Japan, Jul. 10, 1980, 55-93239; Sep. 22, 1980, 55-130619; Sep. 22, 1980, 55-130620; Oct. 31, 1980, 55-152215; Feb. 17, 1981, 56-20824; May 22, 1981, 56-76727; May 22, 1981, 56-76728; May 25, 1981, 56-78002; May 25, 1981, 56-78003; May 28, 1981, 56-79978

Int. Cl.³ B32B *5/16, 27/36, 5/08*

U.S. Cl. 428—331 **32 Claims**

1. A shaped polyester composite material having an activated surface thereof, comprising:

a shaped substrate comprising a polymeric matrix consisting essentially of an aromatic linear polyester and fine solid particles each comprising mainly silicon dioxide and having an average size of 5 to 100 millimicrons said silicon dioxide fine particles being dispersed in at least a portion of said shaped substrate and the amount of said fine particles being in the range of 0.3% to 15% based on the weight of said polyester matrix in which said fine particles are dispersed; and

a surface coating layer formed on the silicon dioxide fine particle-containing surface portion of said shaped substrate wherein said silicon dioxide fine particles are located and comprising from 0.5% to 10%, based on the weight of said shaped substrate, of a surface-activating material consisting of at least one member selected from the group consisting of silane coupling compounds and organic titanium compounds, and mixed with from 0.05% to 2%, based on the weight of said shaped substrate, of an additional material comprising at least one polyepoxide compound, said surface coating layer having been heat-treated together with said shaped substrate at a temperature of 50° C. or more but at least 10° C. below the melting point of said polyester matrix.

4,414,273

THERMAL RECORDING MATERIALS

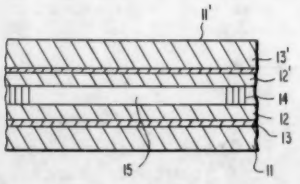
Minoru Wada; Yonosuke Takahashi, and Eiichi Hasegawa, all of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 20, 1982, Ser. No. 380,319

Claims priority, application Japan, May 20, 1981, 56-74819

Int. Cl.³ B32B *15/04, 15/08*

U.S. Cl. 428—336 **17 Claims**



1. In thermal recording materials comprising a thermal recording layer of high optical density provided on a base, the improvement wherein the recording layer comprises a mixture of a metal and a substance capable of increasing recording sensitivity, said substance being present in an amount of 10 to 80% by volume and further wherein a stabilizing film composed of at least one metal selected from the group consisting of In, Al, Ag, Au, Rh, Pd, Ir and Pt is provided on at least one face of said recording layer, said film having a thickness of 22 to 100 Å and said stabilizing film preventing deterioration of said recording layer due to moisture or oxygen in the air.

4,414,274

THIN FILM ELECTRICAL RESISTORS AND PROCESS OF PRODUCING THE SAME

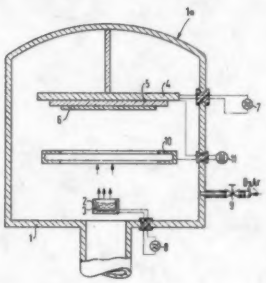
Konrad Hieber, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 107,829, Dec. 28, 1979, abandoned, which is a continuation-in-part of Ser. No. 909,036, May 24, 1978, abandoned. This application Jun. 14, 1982, Ser. No. 388,180

Claims priority, application Fed. Rep. of Germany, May 31, 1977, 2724498

Int. Cl.³ H01C *7/00*

U.S. Cl. 428—336 **3 Claims**



1. An electrical layer resistor comprised of a substrate and layer of electrically conductive material positioned on a surface of said substrate, said conductive material comprising a substantially homogeneous amorphous chromium-silicon-oxygen alloy having an empirical formula:

$$Cr_xSi_yO_z$$

wherein

x is a number in the range of 0.3 to 0.39,

y is a number in the range of 0.4 to 0.52, and

z is a number in the range of 0.1 to 0.30

with the proviso that the sum of x, y, and z is equal to one, said layer of conductive material having a thickness ranging between about 8 nm and 50 nm, said conductive material possessing a relative high degree of stability, a relatively low temperature coefficient of electrical resistance ranging between about 0 and −400 ppm/°K. and exhibiting a specific electrical resistance in the range of about 2000 to 16,000 μΩ-cm.

4,414,275

UV CURABLE ADHESIVE TAPE

John Woods, Dublin, Ireland, assignor to Loctite (Ireland) Limited, Tallaght, Ireland

Filed Jul. 13, 1981, Ser. No. 282,782

Int. Cl.³ C09J *7/02;* **B32B** *27/30*

U.S. Cl. 428—352 **34 Claims**

1. A flexible tape comprising a thermoplastic support film etched on one side with a suitable etchant or etching method, said eteched side being coated with a polyvinylformal precoat, and further coated with a photo-sensitive adhesive composition comprising,

(i) at least one polymerizable acrylate ester monomer;
(ii) a photo-initiator,
(iii) optionally a film former;
and the other side of said thermoplastic support film being coated with a release agent.

4,414,276
NOVEL ASSEMBLY OF COMPOSITE FIBERS
Tsutomu Kiriyama; Susumu Norota; Yasuhiko Segawa; Shingo Emi; Tadasi Imoto, and Toshinori Azumi, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan
Filed Jul. 29, 1981, Ser. No. 288,202
Claims priority, application Japan, Jul. 29, 1980, 55-103067; Sep. 19, 1980, 55-129056; Oct. 23, 1980, 55-147547
Int. Cl.³ D01D *3/00, 5/10, 5/20, 5/28;* **D02G** *3/04*
U.S. Cl. 428—374 **20 Claims**

1. An assembly of fibers composed of at least two dissimilar fiber-forming polymers, characterized by the fact that
(1) it consists of numerous separated fibers,
(2) at least 90% of said fibers have a noncircular cross-sectional shape,
(3) the cross sections of at least 50% of said fibers differ from each other in at least one of shape and size, and
(4) at least 50% of said fibers each have in their cross section taken at right angles to the fiber axis at least two side-by-side coalesced blocks of at least two dissimilar fiber-forming polymer phases with at least a part thereof being exposed to the peripheral surface of the fiber, at least one of the number, shape and size of the blocks varying from fiber to fiber.

4,414,277
MIXTURES COMPRISING FLUORINATED PYROMELLITATE OLIGOMERS USEFUL AS SURFACTANTS AND PROCESSES FOR THE PRODUCTION AND USE THEREOF
Bryce C. Oxenrider, Florham Park, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.
Filed Aug. 30, 1982, Ser. No. 412,620
Int. Cl.³ B32B *27/34;* **B05D** *3/02*
U.S. Cl. 428—395 **16 Claims**

1. A process for the production of an organic mixture useful as a fiber surface modifying agent wherein said mixture comprises oligomeric compounds and wherein said process comprises:
(a) reacting pyromellitic dianhydride with fluorinated alcohol at a mole ratio of about two moles of fluorinated alcohol per mole of pyromellitic dianhydride to produce a pyromellitate having two fluorinated ester moieties and two carboxylic acid moieties;
(b) reacting said pyromellitate of step (a) with an excess of an oxirane compound selected from the group consisting of epichlorohydrin, epibromohydrin, and propylene oxide in the presence of additional pyromellitic dianhydride to produce said organic mixture comprising oligomeric compounds; wherein said oxirane compounds react with said carboxylic acid moieties to produce an ester having a primary or secondary alcohol, and wherein said alcohol reacts with said additional pyromellitic dianhydride to produce ester-linking moieties and carboxylic acid moieties capable of reacting with said oxirane compound to produce additional esters having primary or secondary alcohols.

4,414,278
CROSSLINKED TRIACRYLATE POLYMER BEADS
Abraham B. Cohen, Springfield, N.J., and Christina N. Lazaridis, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Apr. 22, 1982, Ser. No. 370,992
Int. Cl.³ B32B *5/16*
U.S. Cl. 428—402 **10 Claims**

1. Discrete, substantially nonswellable, crosslinked polymeric beads having an average diameter size in the range of 0.7 to 20 μm, wherein at least 90% of the beads by population are below 20 μm, the beads being nonagglomerating in any solvent or solvents including a solvent or solvents for the monomer or monomers used in the preparation of the polymeric beads which are taken from the class consisting of homopolymers of tri- and tetraacrylate and tri- and tetramethacrylate monomers, copolymers of said tri- and tetraacrylate and tri- and tetramethacrylate monomers, copolymers of one of said tri- and tetraacrylate or said tri- and tetramethacrylate monomers and up to 25% by weight of at least one monomer having one terminal ethylenic group, copolymers of one of said tri- and tetraacrylate or said tri- and tetramethacrylate monomers and up to 50% by weight of at least one monomer having two terminal ethylenic groups or three terminal ethylenic groups different from said triacrylate or trimethacrylate monomers.

4,414,279
BINDER COMPOSITIONS FOR POWDER COATINGS
Daniel Bernelin, Ris Orangis, and Jacques Meyer, Paris, both of France, assignors to Chloe Chimie, Puteaux, France
Division of Ser. No. 294,521, Aug. 20, 1981, Pat. No. 4,371,638, which is a continuation of Ser. No. 12,020, Feb. 14, 1979, abandoned. This application Sep. 23, 1982, Ser. No. 422,024
Claims priority, application France, Feb. 20, 1978, 78 04685
Int. Cl.³ B32B *27/36, 27/38*
U.S. Cl. 428—413 **8 Claims**

1. A process for producing a cross-linked coating having a non-gloss surface comprising applying to a substrate a powder coating composition comprised of a binder composition comprising at least two saturated cross-linking polyester resins and a cross-linking agent, said resins exhibiting different reactivities with respect to said cross-linking agent wherein the resin exhibiting the highest reactivity has a hydroxyl index between about 175 and 185 and the resin exhibiting the lowest reactivity has a hydroxyl index between about 40 and 60, and heating the thus applied coating to a temperature between about 160° and 220° C. for a period of time between about 5 to 40 minutes to effect cross-linking.

4,414,280
MEMBRANES AND COMPOSITES FROM FLUOROPOLYMER SOLUTIONS
Raimund H. Silva; Paul R. Resnick, both of Wilmington, Del., and Roger A. Smith, Kennett Square, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Division of Ser. No. 176,595, Aug. 8, 1980, Pat. No. 4,348,310, which is a continuation-in-part of Ser. No. 79,173, Sep. 26, 1979, abandoned. This application Dec. 3, 1981, Ser. No. 327,062
Int. Cl.³ B32B *27/24*
U.S. Cl. 428—422 **4 Claims**

3. An inert support material coated by fluoropolymer from a solution of fluoropolymer in halogenated solvent wherein: the fluoropolymer is present in an amount greater than 0.5 percent, by weight, of the solution at 25° C.; the solvent is a perhalogenated, saturated liquid having at least one alkyl segment, at least one alkyl ether segment, and at least one terminal polar group wherein the halogens in the liquid are selected from the group consisting of F, Cl, Br, and I, the alkyls have one to three carbon atoms, and the polar groups are either alkyl carboxyl ester or sulfonyl fluoride; and the fluoropolymer is a copolymer of tetrafluoroethylene and perfluorinated sulfonyl fluoride- or carboxyl-containing vinyl monomer having an equivalent weight of greater than 1000.

4,414,281
GLASS-CERAMIC ARTICLES HAVING METALLIC SURFACES

Syed N. Hoda, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

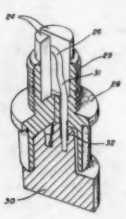
Filed Feb. 16, 1982, Ser. No. 349,000
Int. Cl.³ C03C *3/22*
U.S. Cl. 428—433 **2 Claims**

1. A composite article composed of a substrate consisting of a glass-ceramic, wherein the predominant crystal phase is a synthetic fluormica selected from the group of normal fluorophlogopite, alkali metal boron fluorophlogopite, and alkaline earth metal fluorophlogopite, which is mechanically machinable and an integral, electrically-conductive surface layer consisting of metallic copper and/or silver, said glass-ceramic consisting essentially, expressed in terms of weight percent on the oxide basis, of about 6–22% MgO, 10–18% MgF, an effective amount up to 6% Cu_2O and/or Ag_2O, 0–14% K_20, 0–16% BaO, 0–12% SrO, 0–10% CaO, 0–22% Al_2O_3, 0–18% B_2O_3, and 30–47% SiO_2.

4,414,282
GLASS CERAMIC SEALS TO INCONEL

Howard L. McCollister, Albuquerque, N. Mex., and Scott T. Reed, Albuquerque, N. Mex., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Apr. 19, 1982, Ser. No. 369,965
Int. Cl.³ B32B *15/00*
U.S. Cl. 428—433 **22 Claims**



1. A glass ceramic composition prepared by subjecting a glass composition comprising, by weight, 65–80% SiO_2, 8–16% Li_2O, 2–8% Al_2O_3, 1–8% K_2O, 1–5% P_2O_5 and 1.5–7% B_2O_3, to the following processing steps:

a. heating the glass composition to a temperature sufficient to crystallize lithium metasilicate therein;

b. holding the glass composition at a temperature and for a time period sufficient to dissolve the lithium metasilicate therein thereby creating cristobalite nucleii;

c. cooling the glass composition and maintaining the composition at a temperature and for a time period sufficient to recrystallize lithium metasilicate therein; and

d. thermally treating the glass composition at a temperature and for a time period sufficient to cause growth of cristobalite and further crystallization of lithium metasilicate producing a glass ceramic composition having a specific thermal expansion coefficient.

8. A process for forming a seal between a glass having a thermal expansion coefficient α of $120–160\times10^{-7}$/°C. and a nickel base alloy having substantially the same thermal expansion coefficient, comprising the steps of:

1. applying a glass having a composition, by weight, of 65–80% SiO_2, 8–16% Li_2O, 2–8% Al_2O_3, 1–8% K_2O, 1–5% P_2O_5 and 1.5–7% B_2O_3 to the nickel base alloy, and subjecting the glass to the following processing steps:

a. heating the glass composition to a temperature sufficient to crystallize lithium metasilicate therein;

b. holding the glass composition at a temperature and for a time period sufficient to dissolve the lithium metasilicate therein thereby creating cristobalite nucleii;

c. cooling the glass composition and maintaining the composition at a temperature and for a time period sufficient to recrystallize lithium metasilicate therein; and

d. thermally treating the glass composition at a temperature and for a time period sufficient to cause growth of cristobalite and further crystallization of lithium metasilicate producing a glass ceramic composition having a specific thermal expansion coefficient.

11. A product produced by the process of claim 8.

4,414,283
ACRYLIC MODIFIED ANIONIC WATER DISPERSIBLE STYRENE ALLYL ALCOHOL COPOLYMERS

Michael A. Tobias, Bridgewater, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 274,588, Jun. 17, 1981, Pat. No. 4,360,640.
This application Sep. 29, 1982, Ser. No. 426,529
Int. Cl.³ B32B *15/08*
U.S. Cl. 428—461 **11 Claims**

1. A coating composition comprising:

(A) a water-dispersible graft copolymer of an acrylic monomer or monomers and a random copolymer of a styrene and between about 20 weight percent and 30 weight percent of the random copolymer of allyl alcohol, in which at least about 8 percent of the total weight of said graft copolymer is derived from acrylic acid, methacrylic acid, or both, said graft copolymer being neutralized with ammonia, ammonium hydroxide, or a tertiary amine; and

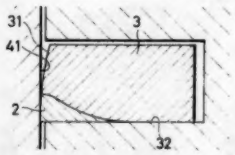
(B) a cross-linking agent;

said composition being diluted with water to a solids content of between about 10 weight percent and about 40 weight percent.

4,414,284
TWO LAYER SINTERED PISTON RING WITH A REST-CURVE LIKE BOUNDARY

Tadashi Ebihara, Hatogaya, Japan, assignor to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Feb. 23, 1982, Ser. No. 351,570
Claims priority, application Japan, Feb. 26, 1981, 56-26118
Int. Cl.³ F16J *9/20*; B22F *7/02*; B32B *7/00*
U.S. Cl. 428—550 **4 Claims**



1. A piston ring produced by a powder metallurgical method, comprising: first and second zones, said first zone being made of a first sintered alloy powder, said second zone being made of a second sintered alloy powder, said second zone having a nearly triangular shape in cross section, one edge of an outer peripheral surface of the piston ring being a vertex of the second triangular-shaped zone, a boundary between said first and second zones having a rest-curve like shape formed by relative movement between a core rod and a punch after said first sintered alloy powder is deposited on an upper surface of said core rod and punch but prior to said second sintered alloy powder being deposited on said first sintered alloy powder.

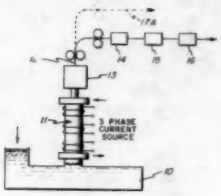
4,414,285
CONTINUOUS METAL CASTING METHOD, APPARATUS AND PRODUCT

Hugh R. Lowry, Fairfield, Conn., and Robert T. Frost, Berwyn, Pa., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 430,830, Sep. 30, 1982, which is a continuation of Ser. No. 165,421, Jul. 2, 1980, abandoned. This application Dec. 30, 1982, Ser. No. 454,600

Int. Cl.³ B22D *27/02*

U.S. Cl. 428—577 **19 Claims**



1. The method of producing a metal product of long length which comprises the steps of forming an elongated upwardly-traveling alternating electromagnetic field within the interior of a surrounding casting vessel, introducing liquid metal into the lower portion of the casting vessel and the field, establishing an alternating electromagnetic field acting on the liquid metal column to provide a levitation ratio between 75% and 200% of the weight per unit length of liquid metal and wherein the optimum fundamental frequency of the alternating electromagnetic field is given by the expression $F=(36\rho/D^2)$ where F is the frequency in kilohertz, ρ is the resistivity of the liquid metal column in micro-ohm-centimeters, and D is the average diameter of the solidified metal product in millimeters to thereby reduce the hydrostatic head of the column and to maintain a predetermined dimensional relationship between the outer surface of the liquid metal column and the interior surrounding surfaces of said casting vessel, maintaining the electromagnetic field at the set value of levitation ratio so that the cross-sectional dimension of the liquid metal in the solidification zone is sufficiently large to preclude formation of a substantial gap between the outer surface of the column and the interior surrounding surfaces of the casting vessel thereby effecting optimized heat transfer conditions between the liquid metal column and the casting vessel for a given rate of production while simultaneously reducing frictional, adhesive and gravitational forces acting on the column to a minimum, moving the liquid metal column upwardly through the casting vessel, solidifying the metal while moving upwardly through said vessel and said field, and removing solidified metal product from the upper portion of said vessel.

4,414,286
COMPOSITE THERMOSTAT METAL

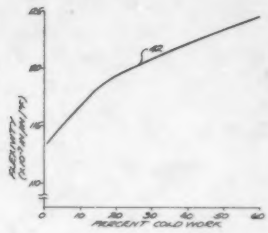
Henry Ty, Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 250,358, Apr. 2, 1981, abandoned. This application May 26, 1981, Ser. No. 267,144

Int. Cl.³ B32B *15/18*

U.S. Cl. 428—616 **13 Claims**

1. A composite thermostat metal adapted to flex when heated comprising first metal layer means having a relatively high coefficient of thermal expansion in a selected temperature range disposed at the high expansion side of the thermostat metal, and second metal layer means having a relatively lower coefficient of thermal expansion in said selected temperature range metallurgically bonded to the first metal layer means to be disposed at the low expansion side of the thermostat metal, the second metal layer means including at least one layer component of an austenitic stainless steel material disposed on an outer surface of the thermostat metal on the low expansion side thereof selected from the group consisting of austenitic stainless steels as set forth in Table III which are subject to significant austenite to martensite transformation during work hardening thereof, the stainless steel layer component having its



coefficient of thermal expansion in said selected temperature range substantially lowered at least as low as 6.0×10^{-6} in./in./°F. by work hardening thereof for cooperating in providing the thermostat metal with a suitably high flexivity of about 55×10^{-7} in./in./°F. or more in said selected temperature range.

4,414,287
MAGNETIC RECORDING MEDIUM AND ITS MANUFACTURE

Eckhart Kneller, Herbede; Roland Koenig, Ludwigshafen; Eberhard Koester, Frankenthal; Werner Grau, Bobenheim-Roxheim, and Dieter Mayer, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 228,718, Jan. 27, 1981, abandoned, which is a division of Ser. No. 126,895, Mar. 3, 1980, Pat. No. 4,287,225. This application Jun. 29, 1982, Ser. No. 393,498

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1979, 2909891

Int. Cl.³ B32B *15/10*

U.S. Cl. 428—650 **2 Claims**

1. A magnetic recording medium comprising a non-magnetic base which is dimensionally stable at up to 300° C., and an 0.03 to 0.4 μm thick, magnetically hard amorphous recording layer of an Sm-Co alloy, wherein the recording layer consists of an amorphous Sm-Co_x alloy, where x is from 1 to 20, possesses uniaxial magnetic anisotropy in the plane of the layer and has a coercive force of from 10 to 100 kA/m and a squareness ratio of more than 0.9.

4,414,288
MAGNETIC RECORDING MEDIUM

Hiroshi Kawahara; Hitoshi Azegami, and Eiji Horigome, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1982, Ser. No. 362,653

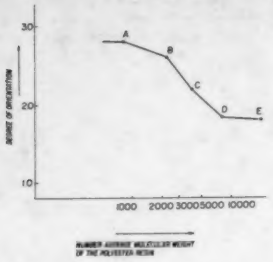
Claims priority, application Japan, Apr. 14, 1981, 56-55099

Int. Cl.³ G11B *5/70*

U.S. Cl. 428—694 **4 Claims**

1. A magnetic recording medium which comprises a substrate coated with a magnetic paint comprising a magnetic powder dispersed in a binder comprising a vinyl chloride-vinyl

acetate copolymer containing at least 10% of polyvinyl alcohol, a urethane resin and a polyester resin, wherein the polyes-



ter resin has a number average molecular weight of 3,000 or less.

4,414,289

HIGH DENSITY MAGNETIC RECORDING MEDIUM

Fujio Shibata, Komoro; Kenji Hirabayashi, Mitsuka-Saku, and Chihoto Mikura, Kunitachi, all of Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Mar. 18, 1982, Ser. No. 359,413

Claims priority, application Japan, Mar. 23, 1981, 56-40465

Int. Cl.³ G11B *5/70*

U.S. Cl. 428—695 **5 Claims**

1. A magnetic recording medium carrying means for recording magnetic information comprised of a nonmagnetic base and a magnetic coating layer fixed on said base, said magnetic coating layer comprises ferromagnetic particles dispersed in a binder vehicle, characterized in that said magnetic coating layer contains a glyceride and a sorbitan ester of fatty acid.

4,414,290

MAGNETIC STRUCTURE SUITABLE FOR THE PROPAGATION OF SINGLE-WALLED MAGNETIC DOMAINS

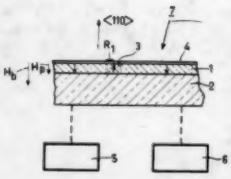
Dirk J. Breed, and Antonius B. Voermans, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 130,889, Mar. 17, 1980, abandoned. This application Mar. 15, 1982, Ser. No. 358,062

Claims priority, application Netherlands, Mar. 23, 1979, 7902293

Int. Cl.³ G11C *11/02*

U.S. Cl. 428—700 **7 Claims**



1. A magnetic structure, in which single-walled magnetic domains can be propagated, comprising:

a monocrystalline, nonmagnetic substrate having a surface extending substantially parallel to a (110) plane of the crystal; and

a monocrystalline layer of a magnetic rare-earth iron garnet, having a partial substitution of Mn^{3+} ions at iron sites, said layer being substantially planar and having been grown under compression on the surface of the substrate, said layer having an easy axis of magnetization substantially perpendicular to the plane of the layer and having a medium axis of magnetization in the plane of the layer;

characterized in that:

the substrate has a lattice constant between 12.23 and 12.38 Å; and

the magnetic layer consists essentially of a material having the formula

$$(Lu_xY_zR_{(1-x-z)})_3Fe_{5-y}Mn_yO_{12},$$

where R is at least one rare earth ion which is larger than a Lu ion, $0<x<1$, $0<z<1$, and y is ≥ 0.15.

4,414,291

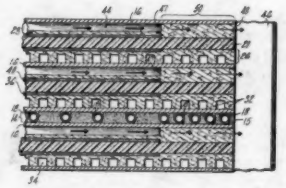
METHOD FOR REDUCING ELECTROLYTE LOSS FROM AN ELECTROCHEMICAL CELL

Richard D. Breault, Coventry, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 219,609, Dec. 24, 1980, Pat. No. 4,345,008. This application May 25, 1982, Ser. No. 381,806

Int. Cl.³ H01M *8/04*

U.S. Cl. 429—14 **4 Claims**



1. In a stack of electrochemical cells, each cell having electrolyte adjacent a gas diffusion type porous electrode wherein during operation said electrolyte evaporates into a reactant gas stream flowing through said cell in operable relationship to said electrode and to said electrolyte, the process of reducing electrolyte loss from said cells as a result of said evaporation comprising the step of cooling said gas stream in a condensation zone within each cell adjacent the reactant gas outlet of each cell so as to condense at lesat some of the electrolyte vapor from the gas stream back into the respective electrode of each cell prior to said gas stream leaving the cell, wherein said condensed-out electrolyte is redistributed within the cell by diffusion or bulk flow within the electrode.

4,414,292

METAL HALOGEN BATTERY SYSTEM

Jozef Kiwalle, West Bloomfield; James H. Galloway, New Baltimore, both of Mich., and John W. Rowan, Stamford, Conn., assignors to Energy Development Associates, Inc., Madison Heights, Mich.

Filed Jan. 29, 1982, Ser. No. 343,904

Int. Cl.³ H01M *8/18*

U.S. Cl. 429—19 **10 Claims**

1. A metal halogen battery construction, with the improved combination comprising,

at least one cell having a positive electrode and a negative electrode for contact with aqueous electrolyte containing the material of said metal and halogen,

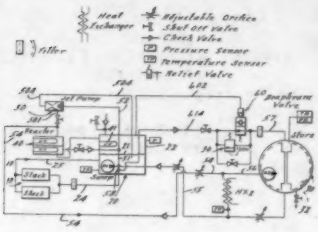
sump means wherein the electrolyte is collected,

store means wherein halogen hydrate is formed and stored as part of an aqueous material,

circulation means for transmitting electrolyte through the battery,

conduit means for transmitting halogen gas formed in the cell to hydrate forming means associated with the store means, and

fluid jet pump means operative to cause circulation of gases from the sump including hydrogen and halogen to contact



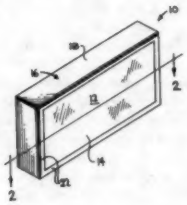
a reactor means whereby hydrogen and halogen are combined and returned to the sump.

4,414,293

PARASITIC CORROSION RESISTANT ANODE FOR USE IN METAL/AIR OR METAL/O_2 CELLS

Richard W. Joy, Santa Clara, and David F. Smith, Boulder Creek, both of Calif., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Sep. 20, 1982, Ser. No. 420,052
Int. Cl.³ H01M *4/12*
U.S. Cl. 429—27 **7 Claims**



1. A consumable anode for use in a corrosive environment of an electrochemical cell, said anode being in the form of a plate-like member having remote faces and a peripheral edge and being formed of a reactive metal, said anode being improved by a protective film of a corrosion inhibiting metal extending entirely over said peripheral edge and at least peripheral portions of said faces to prevent the peripheral edge from being adversely affected by the environment.

4,414,294

ELECTRICALLY INSULATING AND SEALING FRAME

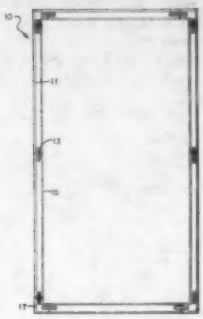
Robin J. Guthrie, East Hartford, Conn., assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Sep. 27, 1982, Ser. No. 424,111
Int. Cl.³ H01M *2/08*
U.S. Cl. 429—35 **7 Claims**

1. A combination electrical insulator and gas seal for use between a reactant gas plenum and a fuel cell stack comprising:

a plurality of electrically insulative segments including segments with angular portions and segments with elongated portions arranged with adjacent ends in near abutment to form a closed frame between the plenum and fuel cell stack;

spline means for slidably connecting the segments together to form the frame configuration;



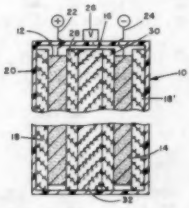
sealing means at opposite face surfaces of the frame engaging the reactant gas plenum and fuel cells stack for minimizing gas leakage from the plenum.

4,414,295

BATTERY SEPARATOR

Toshio Uba, Denver, Colo., assignor to Gates Energy Products, Inc., Denver, Colo.

Filed May 6, 1982, Ser. No. 375,503
Int. Cl.³ H01M *10/52, 2/18*
U.S. Cl. 429—59 **16 Claims**



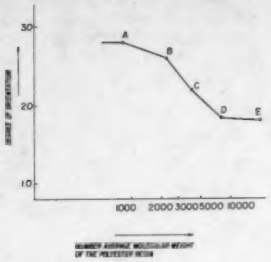
1. A normally sealed maintenance-free lead-acid electrochemical cell having at least one porous positive plate, at least one porous negative plate, a gas permeable separator interposed between such plates, and sulfuric acid electrolyte absorbed in the pores of the plates and separator, said separator comprising:

a first outer porous layer formed of ultrafine fibers readily wetted by sulfuric acid electrolyte, having a fiber surface area in the range from about 0.1 to about 20 square meters per gram of such fiber material, and positioned against a given polarity electrode plate of the cell;

a second such outer porous layer formed of ultrafine fibers, positioned against the opposite polarity electrode plate of the cell; and

a third porous layer interposed between the first and second layers, comprised of ultrafine fibers readily wetted by the sulfuric acid acid electrolyte, having a fiber surface area on an equivalent weight basis substantially less than that of at least one of said first and second layers.

acetate copolymer containing at least 10% of polyvinyl alcohol, a urethane resin and a polyester resin, wherein the polyes-



ter resin has a number average molecular weight of 3,000 or less.

4,414,289

HIGH DENSITY MAGNETIC RECORDING MEDIUM

Fujio Shibata, Komoro; Kenji Hirabayashi, Mitsuka-Saku, and Chihoto Mikura, Kunitachi, all of Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Mar. 18, 1982, Ser. No. 359,413

Claims priority, application Japan, Mar. 23, 1981, 56-40465

Int. Cl.³ G11B *5/70*

U.S. Cl. 428—695 **5 Claims**

1. A magnetic recording medium carrying means for recording magnetic information comprised of a nonmagnetic base and a magnetic coating layer fixed on said base, said magnetic coating layer comprises ferromagnetic particles dispersed in a binder vehicle, characterized in that said magnetic coating layer contains a glyceride and a sorbitan ester of fatty acid.

4,414,290

MAGNETIC STRUCTURE SUITABLE FOR THE PROPAGATION OF SINGLE-WALLED MAGNETIC DOMAINS

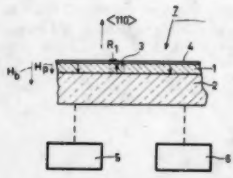
Dirk J. Breed, and Antonius B. Voermans, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 130,889, Mar. 17, 1980, abandoned. This application Mar. 15, 1982, Ser. No. 358,062

Claims priority, application Netherlands, Mar. 23, 1979, 7902293

Int. Cl.³ G11C *11/02*

U.S. Cl. 428—700 **7 Claims**



1. A magnetic structure, in which single-walled magnetic domains can be propagated, comprising:

a monocrystalline, nonmagnetic substrate having a surface extending substantially parallel to a (110) plane of the crystal; and

a monocrystalline layer of a magnetic rare-earth iron garnet, having a partial substitution of Mn^{3+} ions at iron sites, said layer being substantially planar and having been grown under compression on the surface of the substrate, said layer having an easy axis of magnetization substantially perpendicular to the plane of the layer and having a medium axis of magnetization in the plane of the layer;

characterized in that:

the substrate has a lattice constant between 12.23 and 12.38 Å; and

the magnetic layer consists essentially of a material having the formula

$$(Lu_xY_zR_{1-x-z})_3Fe_{5-y}Mn_yO_{12},$$

where R is at least one rare earth ion which is larger than a Lu ion, $0<x<1$, $0<z<1$, and y is $\geqq 0.15$.

4,414,291

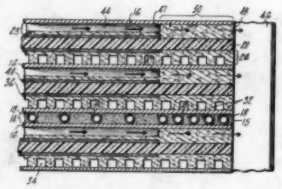
METHOD FOR REDUCING ELECTROLYTE LOSS FROM AN ELECTROCHEMICAL CELL

Richard D. Breault, Coventry, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 219,609, Dec. 24, 1980, Pat. No. 4,345,008. This application May 25, 1982, Ser. No. 381,806

Int. Cl.³ H01M *8/04*

U.S. Cl. 429—14 **4 Claims**



1. In a stack of electrochemical cells, each cell having electrolyte adjacent a gas diffusion type porous electrode wherein during operation said electrolyte evaporates into a reactant gas stream flowing through said cell in operable relationship to said electrode and to said electrolyte, the process of reducing electrolyte loss from said cells as a result of said evaporation comprising the step of cooling said gas stream in a condensation zone within each cell adjacent the reactant gas outlet of each cell so as to condense at lesat some of the electrolyte vapor from the gas stream back into the respective electrode of each cell prior to said gas stream leaving the cell, wherein said condensed-out electrolyte is redistributed within the cell by diffusion or bulk flow within the electrode.

4,414,292

METAL HALOGEN BATTERY SYSTEM

Jozef Kiwalle, West Bloomfield; James H. Galloway, New Baltimore, both of Mich., and John W. Rowan, Stamford, Conn., assignors to Energy Development Associates, Inc., Madison Heights, Mich.

Filed Jan. 29, 1982, Ser. No. 343,904

Int. Cl.³ H01M *8/18*

U.S. Cl. 429—19 **10 Claims**

1. A metal halogen battery construction, with the improved combination comprising,

at least one cell having a positive electrode and a negative electrode for contact with aqueous electrolyte containing the material of said metal and halogen,

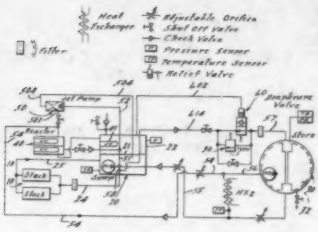
sump means wherein the electrolyte is collected,

store means wherein halogen hydrate is formed and stored as part of an aqueous material,

circulation means for transmitting electrolyte through the battery,

conduit means for transmitting halogen gas formed in the cell to hydrate forming means associated with the store means, and

fluid jet pump means operative to cause circulation of gases from the sump including hydrogen and halogen to contact



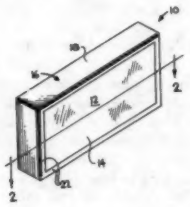
a reactor means whereby hydrogen and halogen are combined and returned to the sump.

4,414,293

PARASITIC CORROSION RESISTANT ANODE FOR USE IN METAL/AIR OR METAL/O_2 CELLS

Richard W. Joy, Santa Clara, and David F. Smith, Boulder Creek, both of Calif., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Sep. 20, 1982, Ser. No. 420,052
Int. Cl.³ H01M *4/12*
U.S. Cl. 429—27 **7 Claims**



1. A consumable anode for use in a corrosive environment of an electrochemical cell, said anode being in the form of a plate-like member having remote faces and a peripheral edge and being formed of a reactive metal, said anode being improved by a protective film of a corrosion inhibiting metal extending entirely over said peripheral edge and at least peripheral portions of said faces to prevent the peripheral edge from being adversely affected by the environment.

4,414,294

ELECTRICALLY INSULATING AND SEALING FRAME

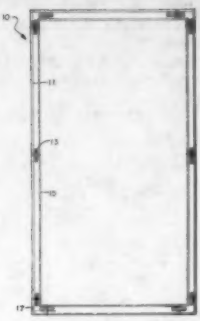
Robin J. Guthrie, East Hartford, Conn., assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Sep. 27, 1982, Ser. No. 424,111
Int. Cl.³ H01M *2/08*
U.S. Cl. 429—35 **7 Claims**

1. A combination electrical insulator and gas seal for use between a reactant gas plenum and a fuel cell stack comprising:

a plurality of electrically insulative segments including segments with angular portions and segments with elongated portions arranged with adjacent ends in near abutment to form a closed frame between the plenum and fuel cell stack;

spline means for slidably connecting the segments together to form the frame configuration;



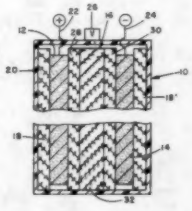
sealing means at opposite face surfaces of the frame engaging the reactant gas plenum and fuel cells stack for minimizing gas leakage from the plenum.

4,414,295

BATTERY SEPARATOR

Toshio Uba, Denver, Colo., assignor to Gates Energy Products, Inc., Denver, Colo.

Filed May 6, 1982, Ser. No. 375,503
Int. Cl.³ H01M *10/52, 2/18*
U.S. Cl. 429—59 **16 Claims**



1. A normally sealed maintenance-free lead-acid electrochemical cell having at least one porous positive plate, at least one porous negative plate, a gas permeable separator interposed between such plates, and sulfuric acid electrolyte absorbed in the pores of the plates and separator, said separator comprising:

a first outer porous layer formed of ultrafine fibers readily wetted by sulfuric acid electrolyte, having a fiber surface area in the range from about 0.1 to about 20 square meters per gram of such fiber material, and positioned against a given polarity electrode plate of the cell;

a second such outer porous layer formed of ultrafine fibers, positioned against the opposite polarity electrode plate of the cell; and

a third porous layer interposed between the first and second layers, comprised of ultrafine fibers readily wetted by the sulfuric acid acid electrolyte, having a fiber surface area on an equivalent weight basis substantially less than that of at least one of said first and second layers.

4,414,296

ELECTROCHEMICAL STORAGE CELL OR BATTERY

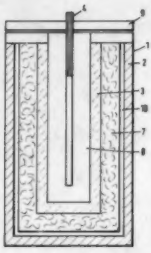
Stefan Mennicke, Leinen-Gau; Karl Reiss, Mühlhausen-Rettigheim, and Kurt Liebermann, Mannheim, all of Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

Filed Apr. 23, 1982, Ser. No. 371,123

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1981, 3117381

Int. Cl.³ H01M *10/39*

U.S. Cl. 429—50 7 Claims



1. Electrochemical storage cell or battery based on alkali metal and chalcogen as reactants with at least one anode space for a first reactant and a cathode space for a second reactant with the anode space and the cathode space separated from each other by an alkali-ion conducting solid electrolyte wall, and bounded by a cell wall of light metal, the combination therewith of a single strongly adhering metal coating on at least the area of the light metal wall in contact with at least one of the two reactants, said metal coating made of titanium and having a maximum thickness of 1 μm.

4,414,297

SHUNT ELEMENT

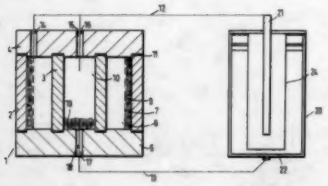
Wilfried Fischer, Neckargemünd, Fed. Rep. of Germany, assignor to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

Filed Apr. 23, 1982, Ser. No. 371,121

Claims priority, application Fed. Rep. of Germany, May 2, 1981, 3117385

Int. Cl.³ H01M *10/42*

U.S. Cl. 429—61 19 Claims



1. Shunt element for an electrochemical storage cell based on alkali metal and chalcogen, with at least one anode space for the anolyte and a cathode space for the catholyte, which spaces are separated from each other by an alkali ion-conducting solid electrolyte wall, and at least in places, are bounded by a metallic housing, comprising a first chamber with its interior space containing a metal or a decomposable metal compound, a second chamber with its interior space having two spaced contact surfaces, said two interior spaces adjoining one another, connecting means through which said metal in the first interior space moves into said adjoining second interior space, a first electrode connected to one spaced contact surface and a second electrode connected to the other contact surface, said first electrode additionally connected to at least one electron-conducting surface of the first space, and said two electrodes adapted for connection to the electrochemical storage cell.

4,414,298

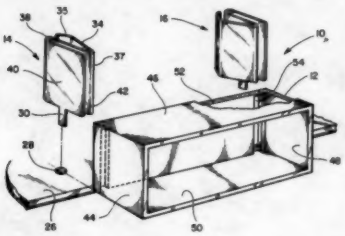
PRINTED CIRCUIT BOARD MOUNT FOR BATTERIES AND THE LIKE

Horst M. Krenz, St. Joseph, Mich., assignor to Heath Company, St. Joseph, Mich.

Filed Jul. 9, 1982, Ser. No. 396,927

Int. Cl.³ H01M *2/10*

U.S. Cl. 429—99 1 Claim



1. A low-cost assembly for mounting a battery, fuse, or other terminal-bearing electrical device on a printed board supporting an electrically conductive pattern, comprising:

a one-piece molded receptacle sized and internally configured to receive one or more of such electrical devices, said receptacle having side walls and opposed end walls, said receptacle having in a side wall a pair of slots, one adjacent each of said end walls;

a pair of generally Z-shaped, resilient, electrically conductive, multi-function sheet material members for simultaneously providing total mechanical retention of said receptacle on the printed circuit board and for making electrical interconnection between an electrical device loaded in the receptacle and the printed circuit board conductive pattern, each member having a folded first portion configured to pass fold-first through one of said receptacle slots against the restorative forces in the fold and to snap into secure embracing engagement with the end wall adjacent the penetrated slot and with a free leg within the receptacle positioned and configured to resiliently engage a terminal of an electrical device loaded in the receptacle, a distal end of said free leg engaging the slot-containing wall of said receptacle to prevent inadvertent escape of said member therefrom, said member having integral with said first portion an outside leg which is external to said receptacle when said member is snapped into said receptacle, said outside leg having an edge tab adapted to be mechanically secured to said printed circuit board and soldered to said conductive pattern, said assembly thereby providing for total mechanical and electrical coupling between a terminal-bearing electrical device loaded into the receptacle and the printed circuit board.

4,414,299

ELECTROCHEMICAL CELLS WITH BETA ALUMINA CERAMIC ELECTROLYTE MATERIAL

Raymond O. Ansell, Warrington, England, assignor to Chloride Silent Power Limited, London, England

Filed Jun. 9, 1982, Ser. No. 386,842

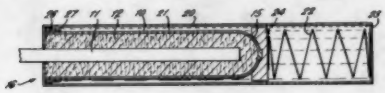
Claims priority, application United Kingdom, Jun. 15, 1981, 8118321

Int. Cl.³ H01M *2/10*

U.S. Cl. 429—104 9 Claims

1. An electrochemical cell having a tube of beta alumina

ceramic electrolyte material, wherein means are provided for applying a compressive load, at least when the cell is at the



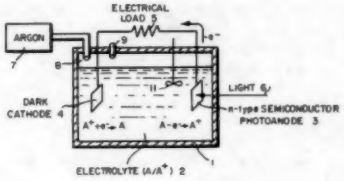
operating temperature, to the beta alumina tube in the axial direction along the whole length or substantially the whole length of the tube.

4,414,300

VISIBLE LIGHT TO ELECTRICAL ENERGY CONVERSION USING PHOTOELECTROCHEMICAL CELLS

Mark S. Wrighton, Medford; Arthur B. Ellis, Brookline, both of Mass., and Steven W. Kaiser, South Charleston, W. Va., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Mar. 29, 1977, Ser. No. 782,596
Int. Cl.³ H01M *6/36*
U.S. Cl. 429—111 **7 Claims**



1. A photoelectrochemical cell comprising
an n-type semiconductor anode,
a metallic cathode,
an alkaline electrolyte containing chalcogenide/polychalcogenide species,
said anode and cathode being immersed in said electrolyte,
said anode capable of being exposed to light,
said chalcogenide/polychalcogenide is selenide/polyselenide, and
said anode is GaAs.

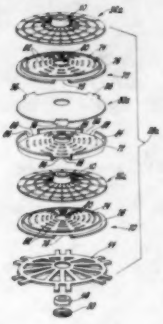
4,414,301

FORMED SEPARATOR SET FOR LEAD ACID BATTERIES

Ronald L. Constein, Lancaster, Pa., assignor to Allied Corporation, Toledo, Ohio

Filed Dec. 10, 1981, Ser. No. 329,375
Int. Cl.³ H01M *2/18*
U.S. Cl. 429—136 **10 Claims**

1. A battery, comprising:
a cylindrical container forming a housing for said battery;
a plurality of frustoconical positive electrodes disposed within said container;
a plurality of frustoconical negative electrodes disposed within said container;
said positive electrodes and said negative electrodes being alternately interleaved within said container;
said negative electrodes being adapted to be joined together at a central portion thereof and to form a central negative column;
said positive electrodes being joined together at predetermined intervals about their respective outer peripheries,
each said frustoconical positive electrode having an outer periphery;
a plurality of first unitary insulating and separating means and a plurality of second unitary insulating and separating means alternately disposed between said interleaved positive electrodes and negative electrodes;
said first unitary separating and insulating means including a first surface portion and a second surface portion and defining a first inner periphery and a first outer periphery, a first lip portion being disposed approximately perpendicular to said first surface portion about said inner periphery;
said second unitary separating and insulating means including a third surface portion and a fourth surface portion and defining a second inner periphery and a second outer



periphery, a second lip portion being disposed approximately perpendicular to said third surface about said second outer periphery;
each said first lip portion being disposed adjacent an inner periphery of one said positive electrode;
each said second lip portion being disposed adjacent an outer periphery of one said negative electrode;
each said first lip being adapted to contact one said fourth surface to insulate one said inner periphery of one said positive electrode;
each said second lip portion being adapted to contact one said second surface to insulate one said outer periphery of one said negative electrode;
one said first surface portion and one said fourth surface being disposed on opposite sides of one of said positive electrodes.

4,414,302

METHOD OF MAKING A LEAD STORAGE BATTERY AND LEAD STORAGE BATTERY MADE ACCORDING TO THIS METHOD

Otto Jache, and Heinz Schroeder, both of Büdingen, Fed. Rep. of Germany, assignors to Accumulatoranfabrik Sonnenschein GmbH, Büdingen, Fed. Rep. of Germany

Filed Oct. 28, 1981, Ser. No. 315,625
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1980, 3041953
Int. Cl.³ H01M *10/12, 10/06*
U.S. Cl. 429—190 **10 Claims**

1. A method of making a lead storage battery with a thixotropic gel electrolyte consisting substantially of sulphuric acid and a gelling agent, and characterized in (a) that sulphuric acid is electrochemically bonded in the active material of the electrodes in the battery, and (b) that the battery thereafter is filled with a gelling agent and a sulphuric acid the concentration of which is insufficient for the formation of a gel, but which is sufficient for initiating a charging process upon application of a voltage.

4,414,303
CADMIUM NEGATIVE ELECTRODE

Thomas R. Williamson, III, Sunrise; Beth B. Jones, Coral Springs; Harold Field, Plantation, all of Fla., and Robert F. Stephenson, El Toro, Calif., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 182,156, Aug. 28, 1980, abandoned. This application Mar. 26, 1982, Ser. No. 362,376
Int. Cl.³ H01M *4/24, 4/02*
U.S. Cl. 429—217 **6 Claims**

1. An improved cadmium negative electrode comprising a substrate for carrying current, and a mass made of cadmium oxide mixed with cadmium metal powder, said cadmium metal powder having particles of irregular gnarled cylindroidal shape and average size of approximately 8 to 25 microns and wherein said mass is electrochemically active, bound into a flexible polymer-bonded mass and attached to said substrate.

4,414,304
FOREHARDENED HIGH ASPECT RATIO SILVER HALIDE PHOTOGRAPHIC ELEMENTS AND PROCESSES FOR THEIR USE

Robert E. Dickerson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 320,910, Nov. 12, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 430,574
Int. Cl.³ G03C *1/02, 1/30, 1/76*
U.S. Cl. 430—353 **24 Claims**

12. In a radiographic element comprised of a substantially specularly transmissive support having first and second major surfaces and, located on each of said major surfaces,

one or more hydrophilic colloid layers including at least one emulsion layer containing radiation-sensitive silver bromide grains containing up to 6 mole percent iodide,

the improvement wherein

at least 50 percent of the total projected area of said silver bromide grains in at least one emulsion layer is provided by thin tabular silver bromide grains optionally containing iodide having a thickness of less than 0.2 micron and an average aspect ratio in the range of at least 12:1 and

said hydrophilic colloid layers being forehardened in an amount sufficient to reduce swelling of said layers to less than 200 percent, percent swelling being determined by (a) incubating said photographic element at 38° C. for 3 days at 50 percent relative humidity, (b) measuring layer thickness, (c) immersing said photographic element in distilled water at 21° C. for 3 minutes, and (d) determining the percent change in layer thickness as compared to the layer thickness measured in step (b).

22. A process of producing a high covering power silver image comprising

imagewise exposing a radiographic element according to any one of claims 12 through 19 and

developing a viewable silver image in less than 1 minute.

24. A process according to claim 22 wherein processing is undertaken at a temperature in the range of from 25° to 50° C.

4,414,305
IMAGE-FORMING METHOD

Koichi Nakamura, and Hiroyuki Hirai, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 28, 1982, Ser. No. 402,703
Claims priority, application Japan, Jul. 28, 1981, 56-117973
Int. Cl.³ G03C *5/32*
U.S. Cl. 430—373 **14 Claims**

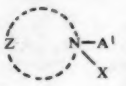
1. An image-forming method, comprising the steps of:

providing a silver halide color photographic material;

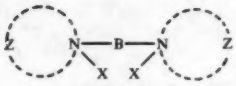
imagewise exposing the material; and

color-developing the exposed material in the presence of a nitrogen-containing heterocyclic compound having the general formula (I) or (II):

General formula (I)



General formula (II)



wherein A is an alkyl group, an alkenyl group, an alkynyl group, an aralkyl group, an alicyclic hydrocarbon group, or an aryl group, each of which may be substituted, B is a substituted or unsubstituted di-valent hydrocarbon group, X is an anion other than iodide and Z is a non-metallic group which forms a heterocyclic ring with a nitrogen atom, wherein said compound is capable of reacting with or being adsorbed into a silver halide, with a mono-bath intensifying developing solution which includes hydrogen peroxide or a compound capable of releasing hydrogen peroxide and a color developing agent, the solution substantially excluding the presence of bromide ions and iodide ions.

4,414,306
SILVER CHLOROBROMIDE EMULSIONS AND PROCESSES FOR THEIR PREPARATION

Jong-Shinn Wey, Penfield, and Herbert S. Wilgus, Conesus, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 320,899, Nov. 12, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 431,854
Int. Cl.³ G03C *1/02, 5/24*
U.S. Cl. 430—434 **36 Claims**

1. A radiation-sensitive emulsion comprised of a dispersing medium and silver halide grains including

tabular grains having opposed, substantially parallel {111} major faces,

said tabular grains containing chloride and bromide in at least annular grain regions,

said tabular grains having a thickness of less than 0.3 micron, a diameter of at least 0.6 micron, and an average aspect ratio of at least 5:1 accounting for at least 35 percent of the total projected area of said silver halide grains, and

the average molar ratio of chloride to bromide in at least said annular grain regions ranging up to 2:3.

4,414,307
METHOD AND COMPOSITION FOR PREPARATION OF PHOTOGRAPHIC COLOR DEVELOPING SOLUTIONS

Jon A. Kapecki; Thomas M. Gormel, and Sheridan E. Vincent, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 24, 1982, Ser. No. 351,846
Int. Cl.³ G03C *5/30*
U.S. Cl. 430—465 **24 Claims**

1. A method of preparing a working strength aqueous alka-

line photographic color developing solution that functions to generate image dyes in a photographic element by the coupling reaction of an oxidized color developing agent with a photographic coupler and that contains a sparingly-soluble alcohol which serves to enhance coupling efficiency, said method comprising admixing together and dissolving in an aqueous medium a plurality of photographic processing agents, one of said agents being a primary aromatic amino color developing agent, a second of said agents being an alkaline agent, and a third of said agents being a solid water-soluble alkali-cleavable precursor of a sparingly-soluble alcohol that is cleaved by the alkaline environment of said color developing solution, whereby said sparingly-soluble alcohol is formed when said plurality of processing agents are admixed together and dissolved in said aqueous medium.

4,414,308

SILVER HALIDE COLOR PHOTOGRAPHIC PHOTOSENSITIVE MATERIAL

Fumio Hamada, Hino, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 16, 1982, Ser. No. 358,685

Claims priority, application Japan, Mar. 20, 1981, 56-42117; Dec. 3, 1981, 56-195317

Int. Cl.³ G03C *1/40*

U.S. Cl. 430—505 **9 Claims**

1. A silver halide color photographic photosensitive material, comprising a red light-sensitive emulsion layer, a green light-sensitive emulsion layer and a blue light-sensitive emulsion layer on a support, each emulsion containing a nondiffusible image forming coupler, being characterized in that at least one of the red light-sensitive emulsion layer, the green light-sensitive emulsion layer and the blue light-sensitive emulsion layer is separated into a high sensitivity silver halide emulsion layer and a low sensitivity silver halide emulsion layer, both layers having photosensitive regions in substantially the same spectral region, by an intermediate layer, and at least one DIR compound represented by formula (I) shown below is incorporated in at least one layer of said high sensitivity silver halide emulsion layer, said low sensitivity silver halide emulsion and the intermediate layer:

A-TIME-Z (I)

wherein A is a coupling component capable of reacting with an oxidized product of a color forming developing agent and releasing a TIME-Z group on reaction with an oxidized product of a color forming developing agent; TIME is a timing group; and Z is a development inhibitor.

4,414,309

PHOTOGRAPHIC RECORDING MATERIAL CONTAINING AN ALDEHYDE REMOVER

Hans Langen, Bonn; Lothar Rosenhahn, Cologne, and Erich Wolff, Solingen, all of Fed. Rep. of Germany, assignors to Agfa-Gavaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

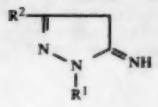
Filed Nov. 24, 1982, Ser. No. 444,452

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1981, 3148108

Int. Cl.³ G03C *1/40*

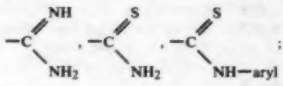
U.S. Cl. 430—551 **5 Claims**

1. Colour photographic recording material containing at least one silver halide emulsion layer and a colour coupler associated therewith, containing an aldehyde scavenger in at least one light-sensitive or light-insensitive layer of binder, characterised in that the aldehyde scavenger contained in the material is a compound corresponding to the following general formula:



wherein

R^1 represents hydrogen, an aliphatic or cycloaliphatic group, an aralkyl group, an aryl group, a heterocyclic group or one of the following groups: —CO—alkyl, —CO—aryl, —CO—heterocyclic, —SO_2—alkyl, —SO_2—aryl, —CO—O—alkyl, —CO—NH—NH_2,



and R^2 represents hydrogen, an aliphatic or cycloaliphatic group, an aralkyl group, an aryl group, alkoxy, aroxy, carboxyl, carbamoyl, alkoxycarbonyl, an alkyl or aryl group attached through a carbonyl group, cyano, an amino group optionally substituted by alkyl, aralkyl, aryl or acyl, or a cyclic amino group.

4,414,310

PROCESS FOR THE PREPARATION OF HIGH ASPECT RATIO SILVER BROMOIODIDE EMULSIONS

Richard L. Daubendiek, Rochester, and Ronald W. Strong, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 320,906, Nov. 12, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 429,587

Int. Cl.³ G03C *1/02*

U.S. Cl. 430—567 **10 Claims**

1. In a process for preparing a radiation-sensitive tabular grain silver bromoiodide emulsion wherein silver and bromide salts are concurrently introduced into a reaction vessel containing an emulsion comprising a dispersing medium and high iodide silver halide grains,

the improvement comprising limiting in the reaction vessel prior to concurrent introduction of silver and bromide salts

the mean diameter of the high iodide silver halide grains to less than 0.1 micron and

the concentration of iodide to less than 10^{-2} mole per liter,

thereby producing within the dispersing medium contained within the reaction vessel silver bromoiodide grains having a thickness of less than 0.3 micron and a diameter of at least 0.6 micron exhibiting an average aspect ratio of greater than 8:1 and accounting for at least 50 percent of the total projected area of said silver bromoiodide grains.

4,414,311

CATHODIC DEPOSITION OF LIGHT SENSITIVE COMPONENTS

John E. Walls, Annandale, and Thomas A. Dunder, High Bridge, both of N.J., assignors to American Hoechst Corporation, Somerville, N.J.

Filed Mar. 18, 1982, Ser. No. 359,458

Int. Cl.³ G03C *1/54, 1/94*

U.S. Cl. 430—157 **11 Claims**

1. A photographic element produced by the method which comprises

(i) electrochemically hydrophilizing an electrically conductive metal substrate surface; and

(ii) subsequently electrolyzing said substrate, which functions as an electrode, in an aqueous electrolytic solution

which comprises a suitable light sensitive, substantially water soluble diazo salt as determined by the herein specified Test Procedure, under electrolytic conditions, with an EMF applied via another electrode in the bath, sufficient to bond said light sensitive composition to said hydrophilized surface.

4,414,312

PHOTOPOLYMERIZABLE POLYAMIDE ESTER RESIN COMPOSITIONS CONTAINING AN OXYGEN SCAVENGER

David L. Goff, Springfield; Edward L. Yuan, Philadelphia, both of Pa., and Stephen Proskow, Wilmington, Del., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 183,648, Sep. 3, 1980, Pat. No. 4,329,419. This application Dec. 24, 1981, Ser. No. 334,164

The portion of the term of this patent subsequent to May 11, 1999, has been disclaimed.

Int. Cl.³ G03C *1/68*

U.S. Cl. 430—283 **11 Claims**

1. A radiation polymerizable comprising about

(a) 10–50% by weight, based on the weight of the composition, of a polyamide ester resin containing photopolymerizable groups,

(b) 50–90% by weight, based on the weight of the composition, of solvent for the resin,

(c) 5–30% by weight, based on the weight of the resin, of radiation polymerizable polyfunctional acrylate compound and

(d) 0.6–20% by weight, based on the weight of the resin, of a blend of polymerization initiators comprising hydrogen donor photointiator and aromatic biimidazole;

(e) 0.1–10% by weigth, based on the weight of the resin, of an oxygen scavenger selected from the group consisting of mercaptobenzothiazole, mercaptobenzoox..zole, n-phenyl glycine, triphenyl phosphine or mixtures thereof, wherein the polyamide ester resin upo heating converts to a polyimide resin.

4,414,313

SENSITIVE POSITIVE ELECTRON BEAM RESISTS

Juey H. Lai, Burnsville, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 29, 1982, Ser. No. 363,334

Int. Cl.³ B05D *3/06*

U.S. Cl. 430—295 **11 Claims**

1. A method of producing a sensitive positive electron resist image comprising the steps of

coating a substrate with a solution of a radiation sensitive polymeric material comprising a copolymer of methacrylic acid (MAA) and methyl α-chloroacrylate (MCA), wherein said copolymer contains from about 30 to 80 mole percent of MAA and from about 70 to 20 mole percent MCA, and wherein the weight average molecular weight of said polymeric material is equal to or greater than 125,000 to form a thin polymeric film of said polymeric material thereon;

prebaking the coated substrate at a temperature below the decomposition temperature of said polymer material;

exposing said polymeric film to electron-beam radiation in a predetermined pattern;

developing said polymeric film.

4,414,314

RESOLUTION IN OPTICAL LITHOGRAPHY

Leon H. Kaplan, Yorktown; Richard D. Kaplan, Wappingers Falls, and Steven M. Zimmerman, Pleasant Valley, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 26, 1982, Ser. No. 352,929

Int. Cl.³ G03C *5/00*

U.S. Cl. 430—311 **10 Claims**

1. An optical lithography process for creating a patterned photoresist on a silicon semiconductor substrate, comprising the steps of;

providing a silicon semiconductor substrate;

evaporating Sudan Black B dyestuff upon said silicon substrate to form a thin film of 4-phenylazo-1-naphthylamine;

depositing positive resists having ether-type solvents on said 4-phenylazo-1-naphthylamine thin film; and

exposing selected regions of said positive resist to light in the 250 to 440 nm wavelength range, the light passing through the selected regions of said positive resist and being absorbed by said 4-phenylazo-1-naphthylamine thin film thereunder, whereby said 4-phenylazo-1-naphthylamine thin film prevents reflection and scattering from the surface of said silicon substrate.

PROCESS FOR MAKING LITHOGRAPHIC PRINTING PLATE

Robert F. Gracia, Scituate, Mass., and Howard A. Fromson, 15 Rogues Ridge Rd., Weston, Conn. 06880, assignors to Howard A. Fromson, Weston, Conn.

Continuation-in-part of Ser. No. 64,322, Aug. 6, 1979, abandoned. This application Jun. 17, 1981, Ser. No. 274,342

Int. Cl.³ G03F *7/20, 7/08*

U.S. Cl. 430—302 **10 Claims**

1. Process for making an aluminum lithographic printing plate which comprises:

(a) providing a silicated aluminum substrate having a hydrophilic, anionic, negatively charged surface and a layer on said surface of a light sensitive, cationic, positively charged, water soluble diazo material having at least two reactive sites per molecule, each reactive site being capable of chemical alteration by actinic light or chemical reaction with an anionic material;

(b) selectively and incompletely exposing the diazo layer to actinic light to alter only a portion of the reactive sites, thereby adhering the diazo material to the substrate in the exposed areas;

(c) removing unexposed diazo by contacting the plate after exposure with a solution consisting essentially of an anionic material in water in a quantity and for a time sufficient to couple the diazo with the anionic material and dissolve the coupled product from the non-image area; and

(d) rinsing with water to provide a printing plate having a reinforced, oleophilic image and a clean, hydrophilic background.

4,414,316

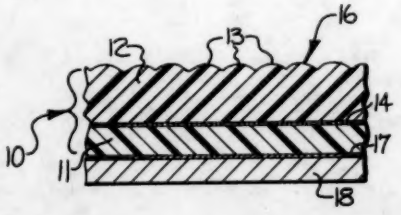
COMPOSITE LENTICULAR SCREEN SHEET

Kenneth E. Conley, Matthews, N.C., assignor to Rexham Corporation, New Yor., N.Y.

Filed Sep. 5, 1980, Ser. No. 184,240

Int. Cl.³ G02B *27/00*

U.S. Cl. 430—496 **9 Claims**



1. A flexible, composite transparent lenticular screen sheet suitable for use in producing three-dimensional optical effects and characterized by having a uniform overall thickness and having lenticular formations of uniform fine definition and

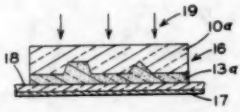
quality and with a uniform focal length precisely correlated with the overall thickness of the composite sheet to provide uniform high quality three-dimensional optical effects throughout the lenticular screen sheet, said lenticular screen sheet comprising a flexible optically transparent base film having opposing front and rear surfaces with the distance therebetween varying over the extent of the base film due to inherent accuracy limitations in the production of said base film and resulting in relatively small but measureable undulating variations in the thickness of the base film, and an optically transparent coating of a cured thermosetting polymer extending over substantially the entire front surface of said base film and bonded thereto, said coating having a nonplanar outer surface defining a series of elongate rib-like lenticular lens formations of predetermined width and radius of curvature, said lenticular lens formations being of uniform width and radius of curvature throughout the lenticular screen sheet so that the lens formations have the same focal length throughout the lenticular screen sheet, the thickness of said cured thermosetting polymer layer in which the lenticular lens formations are formed compensatingly varying in relation to said undulating variations in thickness of said base film so that the distance from the center of curvature of the lenticular lens formations to the rear surface of said base film is uniform throughout the lenticular screen sheet in spite of said undulating variations in thickness of the base film whereby variations in thickness in the overall composite sheet are eliminated, and said overall thickness of the composite being correlated with the focal length of said lenticular lens formations so that the focal plane of the lenticular lens formations is located substantially at said rear surface of said base film.

4,414,317

TRANSPARENCY, A METHOD FOR FORMING IT AND A PHOTOGRAPHIC MASK WHOSE OPTICAL DENSITIES ARE CORRELATED WITH THE CONTOUR OF A SURFACE

Charles R. Culp; Larrimore B. Emmons, and Walter J. Lewicki, Jr., all of Lancaster, Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Apr. 21, 1982, Ser. No. 370,415
Int. Cl.³ B05B *5/00*; B65B *33/00*; B32B *3/00*
U.S. Cl. 430—4 **15 Claims**



1. A method for forming a transparency adapted to be used in a photo-resist and etching process, comprising:
(a) providing a substrate, having a contoured surface;
(b) forming a first conformed transparent layer on the contoured surface of the substrate to produce a sheet having one planar surface and one contoured surface;
(c) removing the first transparent layer from the substrate;
(d) forming a second conformed transparent layer on the contoured surface of said first transparent layer to form a composite two-layer transparency having substantially parallel, planar top and bottom surfaces, and a contoured interface therebetween, one of said first or second transparent layers being uniformly colored, the other of said layers being uncolored, or having a less intense, uniform, similar, or different color, each of said layers having a refractive index substantially equal to that of the other layer at all points, thus allowing light to enter and exit the two-layer transparency in a direction substantially perpendicular to its top and bottom surfaces in substantially unrefracted parallel rays, with the amount of light transmitted therethrough being related to the variations in thickness of the most intensely colored layer.

2. The method for forming a transparency according to claim 1, wherein the first conformed transparent layer formed on the contoured surface of the substrate is the one that is uniformly and most intensely colored.

3. The method for forming a transparency according to claim 1, wherein the second conformed transparent layer formed on the contoured surface of the first transparent layer is the one that is uniformly and most intensely colored.

4. The method of forming a transparency according to claim 1 wherein the second conformed layer comprises a liquid.

9. A method for preparing a photographic mask for use in a photo-chemical etching process, comprising:
(a) forming a two-layer transparency by the methods of either claims 1, 2, 3, or 4;
(b) placing the transparency over a photographic film or plate;
(c) passing light through the transparency to provide an exposed film or plate; and
(d) developing the exposed film or plate to produce a mask having variations in optical density corresponding to the variations in the amount of light transmitted through the transparency and to variations in the contour of an original surface.

4,414,318

METHOD OF EXPOSING TO LIGHT FLUORESCENT SCREENS OF COLOR PICTURE TUBES

Masahiko Nishizawa, and Takashi Fujimura, both of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 24, 1982, Ser. No. 361,267
Claims priority, application Japan, Mar. 27, 1981, 56-43855
Int. Cl.³ G03C *5/04*
U.S. Cl. 430—24 **1 Claim**

1. In a method of exposing to light a fluorescent screen of an in-line dot type color picture tube wherein an inner surface of a panel of said tube coated with a photosensitive film, a shadow mask, and a linear type extra-high pressure mercury lamp covered by a shielding plate having an opening are disposed substantially in parallel so as to expose predetermined areas on the inner surface of said panel to light passing through apertures of said shadow mask, said method comprising:
forming a plurality of openings in said shielding plate with a mutual longitudinal spacing of $n \times B_p(L/Q)$ where B_p represents a lateral pitch between adjacent apertures of said shadow mask, L a distance between said mercury lamp and the inner surface of said panel, Q a distance between the shadow mask and the inner surface of the panel, and n a positive integer when the length of said mercury lamp lies in the lateral pitch direction of the shadow mask; and
exposing said areas on the inner surface of the panel to light from the plurality of said openings through the apertures of

said shadow mask thereby increasing exposure efficiency corresponding to said plurality.

4,414,319

PHOTOCONDUCTIVE MEMBER HAVING AMORPHOUS LAYER CONTAINING OXYGEN

Shigeru Shirai, Yokohama; Junichiro Kanbe, Yamato, and Tadaji Fukuda, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 29, 1981, Ser. No. 316,552

Claims priority, application Japan, Jan. 8, 1981, 56-1785; Jan. 8, 1981, 56-1786; Jan. 9, 1981, 56-2274

Int. Cl.³ G03G 5/082

U.S. Cl. 430—65 70 Claims

1. A photoconductive member, comprising a support for a photoconductive member and an amorphous layer which comprises silicon atoms as matrix containinp at least one of hydrogen atom and halogen atom and exhibits photoconductivity, said amorphous layer having a layer region containing oxygen atom in at least a part thereof, the content of the oxygen atoms in said layer region being distributed unevenly in the direction of the thickness of said layer.

4,414,320

BIS ARYL-AZO DERIVATIVES OF 2,3-NAPHTHALENEDIOL AND ELECTROPHOTOGRAPHIC LIQUID DEVELOPER COMPOSITIONS CONTAINING THEM

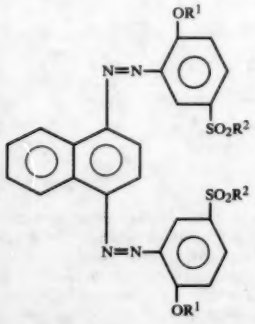
Domenic Santilli, Webster; Jeanne E. Kaeding, and Louis J. Rossi, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 264,312, May 18, 1981. This application Jan. 31, 1983, Ser. No. 462,281

Int. Cl.³ G03G 9/12

U.S. Cl. 430—106 3 Claims

1. In a liquid electrophotographic developer comprising a dispersion of a pigment and a binder resin in an electrically insulating liquid, the improvement wherein said pigment is a compound of the formula:



wherein R^1 is lower alkyl and R^2 if -F or:

wherein R^3 and R^4 are hydrogen, lower alkyl, phenyl, naphthyl, or phenyl or naphthyl substituted by lower alkyl, and are the same or different.

4,414,321

DRY COMPOSITE BLENDED MAGNETIC DEVELOPER OF RESIN ENCAPSULATED FINE MAGNETITE AND RESIN ENCAPSULATED COARSE MAGNETITE

Nobuhiro Miyakawa; Masanori Fujii, both of Suita, and Kouzi Maekawa, Kyoto, all of Japan, assignors to Mita Industrial Co. Ltd., Osaka, Japan

Filed Nov. 24, 1981, Ser. No. 324,652

Claims priority, application Japan, Nov. 27, 1980, 55-165828; Dec. 2, 1980, 55-169151

Int. Cl.³ G03G 9/08

U.S. Cl. 430—106.6 14 Claims

1. A dry composite magnetic developer for electrophotography which comprises a mixture of (A) a first particulate shaped article of a composition comprising a binder resin medium and a non-pulverizing agglomerate of cubic particles of magnetite wherein numerous fine particles of magnetite are so densely aggregated with one another that the particle size distribution is not substantially changed even after ball-milling for five hours' treatment, said agglomerate having a number average particle size of 2 to 10 microns as measured by an electron microscope and an apparent density of 0.5 to 1.5 g/m as measured according to the method of JIS K-5101, and (B) a second particulate shaped article of a composition comprising a binder resin medium and fine magnetite particles having a particle size of 0.2 to 1 micron, each of the agglomerate in the component (A) and the fine magnetite in the component (B) being present in an amount of 35 to 75% by weight based on the sum of the amounts of the binder resin medium and the magnetite material, the component (A) and the component (B) being present at an (A)/(B) weight ratio of from 95/5 to 10/90, said component (A) having a number average particle size of 5 to 35 microns, said component (B) having a number average particle size of 5 to 30 microns.

4,414,322

TWO-COMPONENT TYPE MAGNETIC DEVELOPER

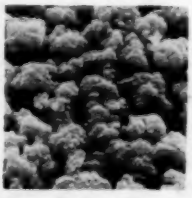
Nobuhiro Miyakawa; Masanori Fujii, both of Suita, and Kouzi Maekawa, Kyoto, all of Japan, assignors to Mita Industrial Co. Ltd., Osaka, Japan

Filed Jan. 22, 1982, Ser. No. 341,820

Claims priority, application Japan, Jan. 26, 1981, 56-8959

Int. Cl.³ G03G 9/14

U.S. Cl. 430—106.6 4 Claims



1. A two-component type magnetic developer comprising a magnetic carrier consisting of a non-pulverizing agglomerate of cubic particles of magnetite wherein numerous fine particles of magnetite are so densely aggregated with one another that the particle size distribution is not substantially changed even by five hours' ball-milling treatment and an insulating magnetic toner consisting of particles having a particle size of 3 to 30 microns, said toner comprising a binder resin medium and magnetite having a particle size smaller than 1 micron, which is dispersed in the binder resin medium, said agglomerate having substantially the same configuration as that shown in the electron microscope photograph of FIG. 1 of the accompanying drawings, a particle size of 2 to 10 microns as measured by an electron microscope and an apparent density of 0.6 to 1.3 g/ml as measured by the method of JIS (Japanese Industrial

Standard) K-5101 and the magnetic carrier/magnetic toner mixing weight ratio is in the range of from 5/100 to 40/100.

4,414,323

METHOD FOR MEASURING TRACE ENZYME

Nobuhito Masuda, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 2, 1981, Ser. No. 298,813
Claims priority, application Japan, Sep. 2, 1980, 55-120601
Int. Cl.³ G01N *33/52, 33/54, 33/58*
U.S. Cl. 435—7 **6 Claims**

1. A method for assaying a sample for enzyme activity and/or a quantity of an enzyme comprising:

(a) providing a synthetic substrate comprising at least one structure (A) catalytically affected by the enzyme being assayed and at least one photographically fogging agent structure (B), said structures (A) and (B) being found in the molecular structure of the synthetic substrate;

(b) contacting the sample with the provided synthetic substrate so as to bring about a chemical reaction by said enzyme;

(c) contacting either the reaction product resulting from (b) or the excess unreacted synthetic substrate also resulting from (b) with silver halide;

(d) photographically developing either product resulting from (c); and

(e) measuring the optical density of the silver image and/or the colored dye resulting from (d).

4,414,324

IMMUNOASSAY METHOD AND APPARATUS

Robert L. Stout, Overland Park, Kans., assignor to BMA Laboratory Services, Inc., Kansas City, Mo.

Continuation of Ser. No. 40,641, May 21, 1979, Pat. No. 4,267,270. This application Apr. 9, 1981, Ser. No. 252,427
The portion of the term of this patent subsequent to May 12, 1998, has been disclaimed.
Int. Cl.³ G01N *33/54*
U.S. Cl. 435—7 **18 Claims**

1. In an assay process for the determination of an immunochemical component in a sample, wherein the sample, a first immunochemical component and a second immunochemical component are immunochemically incubated in a vessel, one of said first and second components being insolubilized in said vessel, one of said first and second components being labeled, said first and second components each having a specific immunochemical affinity for another component in said vessel, or for said component to be determined, during said incubation thereof, the insolubilized component is separated from the remainder of the reaction mixture, and it is thereafter determined whether said sample contained said component to be determined, the improvement which comprises:

covalently bonding to the walls of said vessel a site-deactivating medium for minimizing nonspecific interactions, said insolubilized component being covalently attached to said medium, and

said medium being selected from the group consisting of water soluble animal-derived plasma, animal-derived sera, vegetable-derived gelatins and mixtures thereof.

11. A system for determining the presence of an immunochemical component taken from the group consisting of antigens and antibodies in a sample, comprising:

a vessel having the internal walls thereof covalently bound with a site-deactivating medium,

said medium being selected from the group consisting of water soluble animal-derived plasma, animal-derived sera, vegetable-derived gelatins and mixtures thereof;

an amount of a first immunochemical component covalently bound to said medium; and

an amount of a second unbound immunochemical component,

one of said first and second components being labeled,

said first and second components being present in respective amounts sufficient to perform the assay process of claim 1.

4,414,325

METHOD FOR MEASUREMENT OF TRACE ENZYME

Nobuhito Masuda; Yuji Mihara; Masaki Okazaki, and Hajime Makiuchi, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 2, 1981, Ser. No. 298,814
Claims priority, application Japan, Sep. 2, 1980, 55-120600
Int. Cl.³ G01N *33/52, 33/54, 33/58*
U.S. Cl. 435—7 **10 Claims**

1. A method for determining the activity and/or amount of a particular enzyme in a sample comprising:

(a) providing a synthetic substrate comprising at least one structure (A) catalytically affected by the enzyme being assayed and at least one spectrally sensitizing dye structure (B), said structures (A) and (B) being found in the molecular structure of the synthetic substrate;

(b) contacting the sample with the provided synthetic substrate so as to bring about a chemical reaction by said enzyme;

(c) contacting either the reaction product resulting from (b) or the excess unreacted synthetic substrate also resulting from (b) with silver halide;

(d) exposing the silver halide of either product resulting from (c) to light having wavelengths corresponding to the absorption spectra of the spectrally sensitizing dye structures (B);

(e) photographically developing the silver halide-treated product resulting from (d) with either a black-and-white or color development process; and

(f) measuring the optical density of the developed silver and/or colored dye resulting from (e).

4,414,326

DIAGNOSTIC AGENTS

Jack M. Goldberg, 4612 W. Elm Ter., Skokie, Ill. 60076

Continuation of Ser. No. 108,846, Dec. 31, 1979, abandoned, which is a division of Ser. No. 899,597, Apr. 24, 1978, Pat. No. 4,226,713. This application Feb. 4, 1982, Ser. No. 345,705
Int. Cl.³ C12Q *1/60*
U.S. Cl. 435—11 **8 Claims**

1. A stable, aqueous enzymatic reagent for interaction in the presence of cholesterol to provide a measurable chromophore, said reagent capable of remaining stable for a relatively long period of time comprising:

effective amounts of cholesterol oxidase, cholesterol esterase derived from an animal source, peroxidase, 4-aminoantipyrine, an agent capable of forming a chromophore, a bile salt, a water-soluble polyglycol having an approximate weight average molecular weight in the range of 190–1000 selected from the group consisting of polyethylene glycol and polyethoxy glycol, in an amount of 0.1–1.0 grams per liter of enzymatic reagent and a stabilizer comprising a water-soluble polyglycol having an approximate weight average molecular weight of 6000 or higher in an amount sufficient to maintain solubility of free cholesterol, said enzymatic reagent having a pH in the range of 5.5 to 7.8.

4,414,327

METHOD FOR THE ESTIMATION OF N-ACYLATED PRIMARY AROMATIC AMINES

Peter M. Hammond, Melton Mowbray; Christopher P. Price, Stapleford; Michael D. Scawen, and Anthony Atkinson, both of Salisbury, all of England, assignors to Public Health Laboratory Service Board, London, England

Filed Dec. 1, 1981, Ser. No. 326,276

Claims priority, application United Kingdom, Dec. 2, 1980, 8038634

Int. Cl.³ C12Q *1/34;* C12R *1/39, 1/40*

U.S. Cl. 435—18 **46 Claims**

1. In a method for the estimation of an anilide (N-acylated primary aromatic amine) comprising:

(a) hydrolysing the anilide to an aniline, and

(b) estimating the quantity of said aniline spectrophotometrically,

wherein the improvement comprises conducting step (a) above in the presence of an aryl acylamidase enzyme defined as group EC3.5.1.13, said enzyme being able to catalyse the hydrolysis of the anilide to the aniline.

4,414,328

PROCESS FOR THE PREPARATION OF DEACETYLCEPHALOSPORIN C

Hiroshi Imanaka, Osaka; Toshio Miyoshi, Fuji; Toshio Konomi, Tsushima; Yoshiaki Kubochi; Seiziro Hattori, both of Aichi, and Takeshi Kawakita, Tsu, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Jul. 16, 1981, Ser. No. 283,962

Claims priority, application United Kingdom, Jul. 21, 1980, 8023834

Int. Cl.³ C12P *35/00;* C12N *9/18;* C12R *1/645*

U.S. Cl. 435—47 **5 Claims**

1. A process for the preparation of deacetylcephalosporin C from cephalosporin C, which comprises:

contacting cephalosporin C in an aqueous medium with an acetylesterase produced by *Aureobasidium pullulans* strain IFO 4466, and

recovering deacetylcephalosporin C from said medium.

4,414,329

BIOCHEMICAL CONVERSIONS BY YEAST FERMENTATION AT HIGH CELL DENSITIES

Eugene H. Wegner, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 110,457, Jan. 15, 1980, abandoned, which is a continuation-in-part of Ser. No. 29,418, Apr. 12, 1979, abandoned. This application Oct. 29, 1981, Ser. No. 316,164

Int. Cl.³ C12P *21/00*

U.S. Cl. 435—68 **58 Claims**

1. In a continuous process of biochemical conversion of a carbon energy substrate to products of fermentation comprising yeast cells and extracellular products which comprises culturing at least one yeast under aerobic aqueous fermentation conditions, in aqueous ferment comprising a cellular phase and an aqueous extracellular phase, in fermentation means employing effective amounts of a yeast-assimilable carbon energy substrate, assimilable nitrogen source, water, molecular oxygen, and mineral salts, and withdrawing said aqueous ferment as effluent for recovery therefrom of said products of fermentation,

wherein the improvement comprises feeding said mineral salts to the aqueous ferment in amounts sufficient to maintain in said aqueous ferment the following elements in at least the designated weights per liter of aqueous ferment: P-1.9 g, K-1 g, Mg-0.15 g, Ca-0.06 g, S-0.1 g, Fe-6 mg, Zn-2 mg, Cu-0.6 mg, and Mn-0.6 mg,

thereby producing at least one product of fermentation and maintaining a yeast cell density in said aqueous ferment of at least about 60 to 160 grams, on a dried basis, per liter of said aqueous ferment;

said fermentative means being a fermenter free from physical means to remove liquid medium from said aqueous ferment without removing cells.

4,414,330

PROCESS FOR CONTINUOUSLY GRINDING AND MIXING STARCH-CONTAINING RAW MATERIALS

Friedrich J. Zucker; Georg Osthaus, and Klaus Fisch, all of Neuss, Fed. Rep. of Germany, assignors to Supraton F. J. Zucker GmbH, Fed. Rep. of Germany

Filed Aug. 17, 1981, Ser. No. 293,229

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1981, 3125566

Int. Cl.³ C12C *1/00;* C12P *19/20, 7/06;* C13K *1/06*

U.S. Cl. 435—93 **4 Claims**

1. A process for continuously grinding and mixing starch-containing raw materials for saccharification, characterized in that the material is mashed with hot water having a temperature of 70°–100° C., pre-gelatinized for 0.2–3 hours at a temperature of 80°–95° C. and then ground in the shearing field of a rotor-stator machine having intermeshing radial surfaces.

4,414,331

PROCESS FOR PRODUCING A HIGHLY CONCENTRATED AQUEOUS ACRYLAMIDE SOLUTION BY MEANS OF MICROORGANISMS

Ichiro Watanabe; Yoshiaki Satoh, and Yasumasa Yamaguchi, all of Yokohama, Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Filed Jun. 19, 1980, Ser. No. 160,792

Claims priority, application Japan, Jun. 19, 1979, 54-76351

Int. Cl.³ C12P *13/02;* C12N *11/04;* C12R *1/00, 1/07, 1/13, 1/265, 1/365, 1/15*

U.S. Cl. 435—129 **11 Claims**

1. A process for producing acrylamide from acrylonitrile by utilizing a microorganism or enzyme capable of hydrating acrylonitrile into acrylamide in the form of a highly concentrated aqueous acrylamide solution, comprising bringing acrylonitrile in contact with the microorganism or enzyme in an aqueous medium at a pH of from 6 to 10, at a temperature of from the freezing point to 30° C., and under such conditions that the concentration of acrylamide in the reaction solution after completion of the reaction is from 5% by weight to less than 20% by weight, and concentrating the resulting reaction solution by freezing and/or evaporation, wherein the reaction solution is concentrated to about 31% by weight or less of acrylamide by cooling the reaction solution after the end of the reaction to a temperature of from −4° C. to −9° C. to crystallize ice, separating the crystallized ice, and using the separated ice for cooling during the hydration reaction and wherein said process additionally includes using the ice and melted ice for a feed for the hydration reaction as a component of the aqueous medium.

4,414,332

ENDOPROTEINASE-LYS-C AND PROCESS FOR ITS PREPARATION THEREOF

Jürgen Schrenk, Weilheim, and Peter Wunderwald, Haunshofen, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Aug. 28, 1981, Ser. No. 297,480

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1980, 3034045

Int. Cl.³ C12N *9/50;* C12R *1/01*

U.S. Cl. 435—219 **5 Claims**

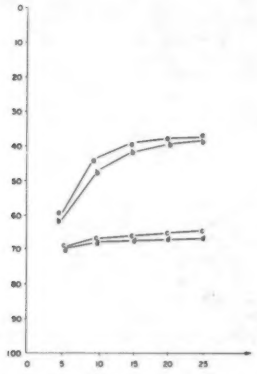
1. Endoproteinase-Lys-C from Lysobacterales which cleaves proteins at the carboxyl group of lysine and consists of a chain of molecular weight 35000 to 38000 Dalton, having a pH optimum at pH 7.7 and inhibited by aprotinin but not

inhibited by α_2-macroglobulin, α_1-antitrypsin and ethylenediamine-tetraacetic acid.

4,414,333
COMPOSITIONS FOR DEPOLLUTING FRESH WATER AND SALT WATER BODIES

Roberto Olivieri, Mentana; Andrea Robertiello, and Ludwig Degen, both of Rome, all of Italy, assignors to Snamprogetti, S.p.A., Milan, Italy

Division of Ser. No. 133,246, Mar. 24, 1981, abandoned, which is a continuation of Ser. No. 823,043, Aug. 8, 1977, Pat. No. 4,230,562. This application Oct. 27, 1981, Ser. No. 315,473
Claims priority, application Italy, Sep. 1, 1976, 26751 A/76; Jun. 8, 1977, 24495 A/77
Int. Cl.³ C02F *3/02*
U.S. Cl. 435—243 **3 Claims**



1. A composition adapted to depolluting fresh and sea water bodies from crude oil, petroleum products and their derivatives, containing phosphorus and slow-release nitrogen in a form which can be assimilated by aquatic micro-organisms capable of metabolizing hydrocarbons, said composition consisting essentially of soybean lecithin as said phosphorus source, and as said nitrogen source a nitrogen source selected from the group consisting of spermidin, butyl hydantoinate and butyl allantoinate, said lecithin and said nitrogen in said phosphorus and slow-release nitrogen containing composition being present in an amount sufficient to increase the natural biodegradation of said pollutants caused by the metabolization of hydrocarbons by said micro-organisms, the ratio by weight of said nitrogen to said phosphorus in said composition being greater than about 12 to 1.

4,414,334
OXYGEN SCAVENGING WITH ENZYMES

Donald O. Hitzman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

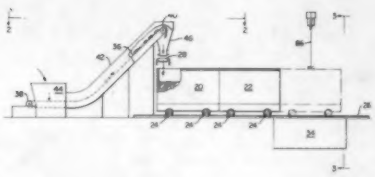
Filed Aug. 7, 1981, Ser. No. 291,146
Int. Cl.³ C12N *9/04*; C10G *32/00*; C12R *1/84*
U.S. Cl. 435—262 **17 Claims**

1. The process which comprises treating an aqueous liquid containing dissolved oxygen with sufficient alcohol oxidase and an alcohol, selected from the group consisting of straight-chain alcohols of 1 to 4 carbon atoms, effective to substantially eliminate said dissolved oxygen, wherein said aqueous liquid is an oil field fluid containing a polymer selected from the group consisting of polyacrylamide, carboxyalkyl cellulose ethers, biopolysaccharides and starch, thereby stabilizing said polymer solution.

4,414,335
COMPOSTING SYSTEM WITH MOVABLE PROCESS CARS

Carl E. Kipp, Jr., South Charleston, Ohio, assignor to Paygro, Inc., South Charleston, Ohio

Filed Dec. 23, 1981, Ser. No. 333,733
Int. Cl.³ C12M *1/04*
U.S. Cl. 435—313 **27 Claims**



1. An apparatus for processing organic waste material in a series of repeated cycles, comprising:
(a) a first processing station;
(b) a loading assembly positioned at the first processing station for charging organic waste material;
(c) a second processing station;
(d) movable containment means for receiving a charge of organic waste material from the loading assembly and storing the organic waste material in a quiescent state as the waste material undergoes aerobic decomposition, said movable containment means being operative to transport the organic waste material from the first to the second processing stations;
(e) means for introducing pressurized air into the organic waste material to augment the growth of thermophilic bacteria as the waste material stored in the containment means undergoes decomposition;
(f) means for discharging the partially decomposed organic waste material from the containment means at the second processing station and mixing the organic waste material with the ambient air; and
(g) means extending from the second to the first processing station for transferring the discharged organic waste material back to the loading assembly independently of the containment means whereby the partially decomposed material may be recharged into the movable containment means.

4,414,336
METHOD FOR PREPARING SAMPLE FOR USE IN ENDOTOXIN TEST

Ryozo Watanabe, Takatsuki; Keiichi Kawasumi, Hirakata; Shoichi Maeda, Osaka, and Takashi Shoji, Tondabayashi, all of Japan, assignors to The Green Cross Corporation, Osaka, Japan

Filed Sep. 29, 1981, Ser. No. 306,647
Claims priority, application Japan, Jan. 28, 1981, 56-11204; Jan. 28, 1981, 56-11205
Int. Cl.³ G01N *33/48, 33/54*
U.S. Cl. 436—502 **7 Claims**

1. A method for preparing a sample for use in endotoxin test which comprises subjecting a sample of plasma or blood preparation to a contact with water-insoluble anti-human α_2-macroglobulin antibody and to a gel filtration by means of a carrier

for gel filtration which is a gel of allyl dextran crosslinked with N,N'-methylenebis acrylamide or a gel of polyvinyl alcohol

having many hydrophilic hydroxyl groups and recovering the maximum molecular weight fraction.

4,414,337

SHAPED CERAMICS

Yoshio Ichikawa, Pittsburgh, and George M. Halgas, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 19, 1982, Ser. No. 379,813
Int. Cl.³ C04B *35/48*
U.S. Cl. 501—103 **27 Claims**

1. A composition comprising:
(a) about 0.45 to about 5.5 percent of an organic water-soluble binder which has a thermal decomposition temperature of about 100° to about 500° C. and a viscosity of less than about 10,000 poises at 20° C.;
(b) about 1.5 to about 4.0 percent of a starch which has a thermal decomposition temperature of about 250° to about 535° C., where the thermal decomposition temperature of said binder and said starch are at least about 50° C. apart;
(c) about 1.5 to about 3.5 percent of cellulose;
(d) about 0.5 to about 2.0 percent of a dispersant;
(e) about 7 to about 11 percent of water; and
(f) about 75 to about 89 percent of a high temperature refractory material.

4,414,338

CATION EXCHANGE MEMBRANE

Kyoji Kimoto, Yokohama, and Hirotsugu Miyauchi, Tokyo, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 52,604, Jun. 27, 1979, abandoned. This application Jun. 30, 1981, Ser. No. 279,156
Int. Cl.³ B01J *39/20*
U.S. Cl. 521—27 **9 Claims**

1. A fluorocarbon type cation exchange membrane consisting essentially of fluorinated polymers having sulfonic acid groups as side chains or as a part of the side chains bonded to the backbone of the fluorinated polymers and also including at least one other cation exchange group therein which is selected from the group consisting of carboxylic acid groups, sulfonamide groups and N-monosubstituted sulfonamide groups, and having an average equivalent weight in the range of from 1100 to 1600, said fluorinated polymers being prepared by blending homogeneously the following two different fluorinated polymers containing sulfonyl fluoride groups and having different cation exchange capacities on the basis of equivalent weight, so that the average equivalent weight is in the range of from 1100 to 1600:
(1) a first sulfonyl fluoride group-containing fluorinated polymer having an equivalent weight of from 1350 to 1900 in terms of sulfonic acid groups converted therein, and
(2) a second sulfonyl fluoride group-containing fluorinated polymer having an equivalent weight which is in the range of from 900 to 1300 in terms of sulfonic acid groups converted therein and which is smaller by at least 200 than that of said first fluorinated polymer, shaping the polymer blend into a film, subjecting at least a surface of the film to a chemical treatment so as to convert the sulfonyl fluoride groups present at the surface of the film into carboxylic acid groups, sulfonamide groups or N-monosubstituted sulfonamide groups, and hydrolyzing the unaltered sulfonyl fluoride groups to convert them into sulfonic acid groups.

4,414,339

LOW DENSITY, ELECTROMAGNETIC RADIATION ABSORPTION COMPOSITION

Jitka Solc, and Robert F. Harris, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 15, 1982, Ser. No. 357,925
Int. Cl.³ G21K *1/10*; G21F *1/10*
U.S. Cl. 523—137 **12 Claims**

1. An ELM absorption composition comprising (1) a solid dielectric material having dispersed therein (2) a colloidal-size particulate having a maximum dimension less than about 1 micrometer of an absorber for electromagnetic radiation and (3) a particulate of an attenuator for electromagnetic radiation, said composition further characterized by having a density less than 6 grams per cubic centimeter (g/cm^3) and substantially all of the particles of the absorber being maintained in a spaced apart relationship by the solid dielectric.

4,414,340

THERMOSETTING COMPOSITIONS

Guy Senatore, and Ralph C. Farrar, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 15, 1983, Ser. No. 466,691
Int. Cl.³ C08K *3/40, 3/22*
U.S. Cl. 523—219 **17 Claims**

1. A thermosetting composition comprising:
(a) 100 parts by weight of an O_2 or CO_2 terminated high vinyl alkadiene polymer, said alkadiene having 4–8 carbon atoms per molecule with the polymer having at least 50 percent content of 1,2 bonded vinyl units;
(b) 2–10 parts by weight of organic peroxide compound;
(c) 5–90 parts by weight polyolefin modifier; and (d) 50–1,000 parts by weight of inorganic filler selected from the group consisting of Group IIA metal carbonates, talc, mica, clay, wollastonite, aluminum trihydrate, and solid or hollow glass beads.

4,414,341

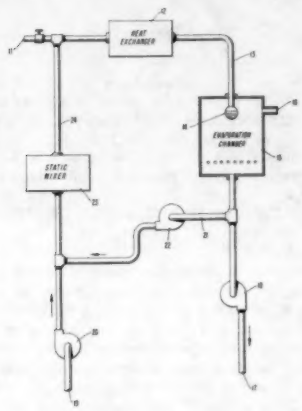
FLASH EVAPORATION PROCESS FOR CONCENTRATING POLYMER SOLUTIONS

Albert G. Williams, West Orange, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Nov. 19, 1980, Ser. No. 208,202
Int. Cl.³ C08J *3/00*; C08L *67/00*
U.S. Cl. 523—340 **32 Claims**

1. A continuous process for concentrating a polymer solution having a polymer concentration of from about 5 to about 50% by weight in the substantial absence of gel formation wherein the solvent thereof has a boiling point below the decomposition temperature of the polymer comprising:
(a) heating the polymer solution to a temperature of not less than the temperature at which the solvent thereof evaporates in the evaporation zone of (b), which temperature is in the range of from about 20° to about 300° C., by passing the solution through a heating zone;
(b) passing the heated polymer solution of (a) from the heating zone through at least one orifice located in an evaporation zone, said evaporation zone containing prior to passage of the polymer solution therein a saturated atmosphere of the vapor of the solvent of the polymer solution at a temperature not greater than the temperature of the polymer solution after it exits the heating zone and not greater than the boiling point of the vapor at the pressure

present within the evaporation zone, to thereby produce a polymer solution having a final concentration of from about 8 to about 60% by weight polymer, based upon the total weight of the polymer solution; and



(c) optionally admixing a part of said concentrated polymer solution of (b) with the unconcentrated polymer solution of (a) prior to passage of the resulting mixture through the heating zone.

4,414,342

GLASS-FILLED THERMOPLASTIC RESINS

John C. Falk, Chicago, and Klementina F. Khait, Skokie, both of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 7, 1981, Ser. No. 328,159

Int. Cl.³ C08K *3/40*; C08L *33/26, 63/08*

U.S. Cl. 523—437 **8 Claims**

1. A composition comprising:

(a) from 95 to 50 wt. % of a blend of

a rigid thermoplastic monovinylidene resin selected from the group consisting of styrenic resins and acrylic resins; and

a copolymer of at least one monovinylidene monomer selected from the group consisting of monovinyl aromatic compounds, acrylic compounds, and methacrylic compounds and from 1 to 20 wt. % of at least one ethylenically-unsaturated monomer containing at least one functional radical selected from the group consisting of carbonyl radicals and epoxy radicals; and

(b) from 5 to 50 wt. % of a glass reinforcing fiber.

4,414,343

EPICHLOROHYDRIN-BASED FLEXIBLE ELASTOMER COMPOSITION

Guy Bex, deceased, late of Gradignan, France; by Josette Bex, legal representative, 135, Route de Canejan, 33170 Gradignan, France, and Yve Carsoule, Residence du Parc du Chateau, Les Noyers "B", 33700 Merignac, France

Filed Nov. 22, 1982, Ser. No. 443,429

Claims priority, application France, Nov. 20, 1981, 81 21784

Int. Cl.³ C08L *63/00*

U.S. Cl. 523—440 **15 Claims**

1. An elastomer composition which comprises:

100 parts by weight of epichlorohydrin homopolymer or copolymer,

0.5 to 20 parts by weight of a plasticizer,

1 to 150 parts by weight of a reinforcing filler constituted by a slightly agglomerated, medium structure carbon black with an average particle size of 200 to 220 microns, an iodine absorption index of 115 to 127 mg/g, a dibutyl phthalate absorption index of 108 to 120 $cm^3/100$ g and an apparent density of 295 to 395 kg/m^3,

0.5 to 7.5 parts by weight of a first acid acceptor constituted by a metal salt of a carboxylic acid having at least 8 carbon atoms,

0.5 to 7.5 parts by weight of a second acid acceptor, constituted by an oxide, a hydroxide or a metal salt,

0.5 to 5.5 parts by weight of at least one protection agent chosen from the group of organic compounds with conjugate aromatic cycles containing amine or phenol functions and alkyl or aryl dithiocarbamate and

0.5 to 5.5 parts by weight of a vulcanizing agent.

4,414,344

MODIFIED SYNTHETIC PLASTIC FROM THERMOPLASTIC SYNTHETICS AND COAL HYDROGENATION RESIDUES

Ingo Romey, Hünxe, Fed. Rep. of Germany, and Menachem El-Roy, Haifa, Israel, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Continuation of Ser. No. 75,741, Oct. 29, 1979, abandoned. This application Feb. 12, 1982, Ser. No. 348,451

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1978, 2839377

Int. Cl.³ C08L *95/00*

U.S. Cl. 524—65 **7 Claims**

1. A synthetic plastic composition comprising a mixture of

(1) at least one elastomeric compound having thermoplastic properties and containing at least one polar, aromatic or cyclic group, and

(2) 50 to 70 weight percent of a low boiling carbonaceous material obtained from the liquefaction of coal having a softening point between 50° and 150° C. which has been freed of solid, non-melting components.

4,414,345

COMPOSITIONS STABILIZED WITH DIOXAPHOSPHEPINES

Michael Rasberger, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 184,876, Sep. 8, 1980, abandoned, which is a division of Ser. No. 39,701, May 18, 1979, Pat. No. 4,259,492. This application Nov. 9, 1981, Ser. No. 319,351

Claims priority, application Switzerland, May 18, 1978, 5390/78

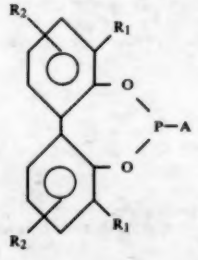
Int. Cl.³ C08K *5/15, 5/51*

U.S. Cl. 524—108 **22 Claims**

1. A composition which comprises

(a) a polymeric organic material to be stabilized, and

(b) 0.005 to 5 percent by weight, based on component (a), of a compound of formula I



(I)

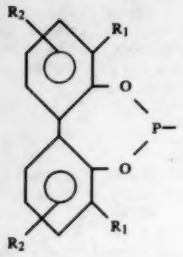
wherein

R_1 and R_2 are each α-branched C_3–C_8 alkyl,

A is a group —$N(R_3)R_4$ (III), wherein

R_3 is hydrogen, C_1–C_{22} alkyl, C_2–C_{21} oxa- or thiaalkyl, C_3–C_{18} alkenyl, C_3–C_{18} alkynyl, C_2–C_6 hydroxyalkyl,

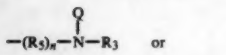
C_3–C_{24} alkoxycarbonylalkyl, C_5–C_{12} cycloalkyl, C_6–C_{14} aryl, C_7–C_{15} alkaryl, C_7–C_{15} aralkyl, a C_5–C_{17} piperidin-4-yl group or said group substituted by up to five methyl or ethyl groups; or a group of the formula II



(II)

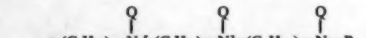
in which R_1 and R_2 have the meanings given above,

R_4 is C_1–C_{22} alkyl, C_2–C_{21} oxa- or thiaalkyl, C_3–C_{18} alkenyl, C_3–C_{18} alkynyl, C_2–C_6 hydroxyalkyl, C_3–C_{24} alkoxycarbonylalkyl, C_5–C_{12} cycloalkyl, C_6–C_{14} aryl, C_7–C_{15} alkaryl, C_7–C_{15} aralkyl, a C_5–C_{17} piperidin-4-yl group or said group substituted by up to five methyl or ethyl groups; a group of the formula IV



(IV)

or



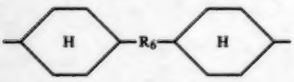
(V)

wherein

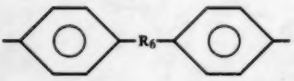
R_3 has the meaning given above,

n is 0 or 1,

R_5 is C_2–C_{22} alkylene; C_4–C_{22} alkenylene, C_4–C_{22} alkynylene or C_5–C_9 cycloalkylene, each of which can be interrupted with one or two oxygen or sulfur atoms, or R_5 is a group of the formula VI



in which R_6 is —O—, —S— or $-(R_7)C(R_8)-$, wherein R_7 and R_8 independently of one another are hydrogen or C_1–C_8 alkyl, or R_7 and R_8 together with the C atom to which they are attached form C_5–C_{12} cycloalkyl, or R_7 and R_8 together are 1,4-cyclohexylenedimethylene or 1,3,3-trimethylcyclohexylene-1,5, or R_5 is also phenylene, biphenylene or a group of the formula



wherein R_6 has the meaning given above, and

r, t and n independently of one another are 2, 3, 4, 5 or 6,

m is 0, 1, 2 or 3,

Q is a group of the formula II, wherein R_1 and R_2 have the meanings given above, or

R_3 and R_4 together with the N atom to which they are attached form a pyrrolidine, oxazolidine, piperidine or morpholine ring; or said pyrrolidine, said oxazolidine, said piperidine or said morpholine substituted by up to five methyl or ethyl groups; or R_3 and R_4 together form the radical $—CH_2—CH_2—N(-Q)—CH_2—CH_2—$ wherein Q has the meaning given above.

4,414,346

AQUEOUS EMULSIONS OF HIGH SOFTENING POINT HYDROCARBON RESINS AND PROCESS FOR PREPARING THE SAME

Frank C. Jagisch, and Morris L. Evans, both of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jan. 15, 1982, Ser. No. 339,647

Int. Cl.³ C08K 5/42

U.S. Cl. 524—158 **5 Claims**

1. An aqueous emulsion of a hydrocarbon resin, said resin having a ring and ball softening point of at least 90° C., consisting essentially of: from 3 to 10 parts by weight of an emulsifier of the class consisting of a nonionic polyoxyethylene alkyl aryl ether, an anionic alkyl aryl sulfonate and mixtures thereof with a mixture of 3 to 10 parts by weight of a resinplast and from 80 to 97 parts by weight of said hydrocarbon resin, said parts by weight being based on the combined weight of said emulsifier, said resinplast and said resin; and, the finished emulsion being 30 to 75 weight % water.

4,414,347

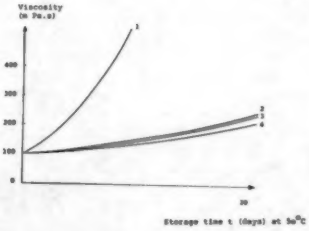
CYANOACRYLATE ADHESIVE COMPOSITION

Karl Reich, Carlsberg, and Heinz Sieger, Eppelheim, both of Fed. Rep. of Germany, assignors to Teroson GmbH, Heidelberg, Fed. Rep. of Germany

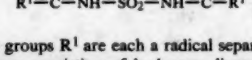
Filed Sep. 15, 1982, Ser. No. 418,496

Int. Cl.³ C08K 5/43

U.S. Cl. 524—168 **5 Claims**



1. An α-cyanoacrylate-based adhesive compositions containing a sulfamide compound of the general formula



in which the groups R^1 are each a radical separately selected from the group consisting of hydrogen, linear or branched alkyl with 1 to 18 carbon atoms, cycloalkyl with 3 to 8 carbon atoms, phenyl methyl, trifluoro- or trichloromethyl or alkoxy $—OR^2$, R^2 being selected from the group consisting of linear or branched alkyl with 1 to 18 carbon atoms, cycloakyl with 3 to 8 carbon atoms, phenyl, di- or triphenylmethyl, phenylalkyl with 1 to 4 carbon atoms in the alkyl group, or alkylphenyl with 1 to 4 carbon atoms in the alkyl radical.

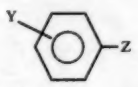
4,414,348

STABILIZED POLYESTER COMPOSITIONS

Richard E. Gloth, Copley; James J. Tazuma, Stow, and Max H. Keck, Cuyahoga Falls, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

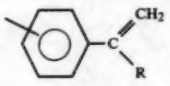
Filed Jan. 26, 1983, Ser. No. 460,980
Int. Cl.³ C08K 5/18
U.S. Cl. 524—255 10 Claims

1. A stabilized polyester composition comprising a polyester having incorporated therein a stabilizing amount of a polymeric diphenylamine compound of randomly distributed repeat units derived from diphenylamine and an additional component, said additional component comprising one or more compounds of structural formula (10)

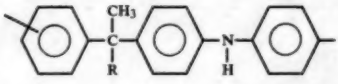


(10)

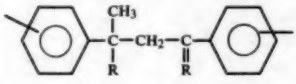
said polymeric compound containing one or more of structures V, VI and VII:



(V)

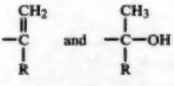


(VI)



(VII)

wherein Y is para or meta relative to Z, Y and Z are the same or different radicals selected from the group consisting of



and R is an alkyl radical of from 1 to 8 carbon atoms, said polymeric diphenylamine compound having a molecular weight of about 425 to about 200,000.

4,414,349

SILICONE RESIN COATING COMPOSITION ADAPTED FOR PRIMERLESS ADHESION TO PLASTIC SUBSTRATES AND PROCESS FOR MAKING SAME

Howard A. Vaughn, Jr., and Ta-Yen Ching, both of Schenectady, N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Jan. 15, 1982, Ser. No. 339,475
Int. Cl.³ C09D 3/82
U.S. Cl. 524—261 39 Claims

1. A coating composition adapted for adhesion to plastic substrates without a primer, said composition being prepared by:

(i) prehydrolyzing a silylated ultraviolet radiation screening compound by reaction with a mixture comprising alcohol, water, and a small amount of an agent to catalyze hydrolysis; and thereafter

(ii) adding the silanol-functional reaction product to an aqueous partially condensed silicone resin composition containing colloidal silica.

4,414,350

FERROUS COMPLEXING AGENT FOR AUTODEPOSITION

Wilbur S. Hall, Plymouth Meeting, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

Continuation-in-part of Ser. No. 79,647, Sep. 27, 1979, abandoned. This application Aug. 24, 1981, Ser. No. 295,582
Int. Cl.³ C08K 5/09
U.S. Cl. 524—320 7 Claims

1. An acidic aqueous autodepositing coating composition of the ferric iron-containing type wherein ferrous iron tends to build up in concentration in the aqueous phase of the composition and affect adversely the coating capabilities of the composition as it is used continuously to form an autodeposited coating on ferrous surfaces, said composition comprising an organic coating-forming material, dissolved ferric iron and hydrofluoric acid, and including also dissolved ferrous iron and, in an amount effective to maintain the coating capabilities of the composition, a carboxylic acid which is soluble in the composition and which is effective in forming a complex with said ferrous iron in the composition, said carboxylic acid having a dissociation constant of about 1.5×10^{-5} to about 1×10^{-3} and being selected from the group consisting of succinic, citric, itaconic, malic, lactic, tartaric, fumaric, glacial acrylic, gallic and acetic acid and a mixture of two or more of said acids.

4,414,351

PRIMER FOR POWDER COATING COMPRISING (A) DIENE POLYMER (B) MGO AND (C) COBALT OR MANGANESE ION

Hajime Suzuki; Ikuo Masuda, and Masaki Kosaka, all of Himeji, Japan, assignors to Daicel Ltd., Osaka, Japan

Division of Ser. No. 971,242, Dec. 20, 1978, Pat. No. 4,268,579, which is a continuation of Ser. No. 665,374, Mar. 10, 1976, abandoned. This application Nov. 5, 1980, Ser. No. 204,149
Claims priority, application Japan, Mar. 19, 1975, 50-33229; Sep. 26, 1975, 50-116099
Int. Cl.³ C08K 3/10; B05D 1/06
U.S. Cl. 524—413 4 Claims

1. A primer composition for use in the coating of a resin powder onto a metal substrate, consisting essentially of a film-forming diene polymer dissolved in an inert organic solvent to form a solution, said solution having dispersed therein from 30 to 110 parts by weight of magnesium oxide particles, per 100 parts by weight of said diene polymer, said solution containing dissolved therein a cobalt compound, a manganese compound or a mixture of said compounds in an amount such that the solution contains from 0.05 to 1.0 part by weight, per 100 parts of said diene polymer, of cobalt ion, manganese ion or mixture thereof.

4,414,352

THERMOPLASTIC MOLDING COMPOSITIONS AND PROCESS

Stuart C. Cohen; Robert J. Kostelnik, and Allen D. Wambach, all of Evansville, Ind., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 35,090, May 1, 1979, abandoned. This application Oct. 15, 1980, Ser. No. 197,132
Int. Cl.³ C08K 3/34
U.S. Cl. 524—443 17 Claims

1. A flame retardant thermoplastic molding composition having improved physical properties, the composition consisting essentially of an intimate mixture of:

(a) a high molecular weight poly(1,4-butylene terephthalate) homo- or copolyester resin;

(b) (i) a copolymer comprised of ethylene and vinyl acetate in combination with an aromatic polycarbonate derived from bisphenol A; or (ii) a mixture of a reinforcing amount of glass fibers and a copolymer comprised of ethylene and

vinyl acetate in combination with an aromatic polycarbonate derived from bisphenol-A;

(c) a flame retardant amount of a flame retardant additive; and

(d) a mineral filler selected from the group consisting of silica, mica, talc, pysophillite, wollastonite and mineral wool, and mixtures of any of the foregoing; component (d) being present in an amount of from about 5 to about 40% by weight sufficient to provide electrical arc track resistance superior to that of a corresponding composition in which mineral filler component (d) is not present.

4,414,353

ORGANIC PIGMENTS

William W. Maslanka, London-Britain Township, Chester County, Pa., and Gavin G. Spence, New Castle County, Del., assignors to Hercules Incorporated, Wilmington, Del.

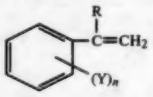
Division of Ser. No. 159,744, Jun. 16, 1980, Pat. No. 4,349,641, which is a division of Ser. No. 909,606, May 25, 1978, Pat. No. 4,235,982, which is a continuation-in-part of Ser. No. 803,330, Jun. 3, 1977, abandoned. This application Mar. 31, 1982, Ser. No. 364,149

Int. Cl.³ C08L *33/26, 39/08*

U.S. Cl. 524—458 **6 Claims**

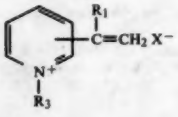
1. Water-insoluble graft copolymer particles consisting essentially of the free radical catalyzed graft copolymerization product of (1) at least one ethylenically unsaturated monomer (a) and at least one polyethylenically unsaturated monomer (b) in an amount at least sufficient to provide cross linked graft copolymer particles, and (2) a water-soluble cationic prepolymer having an RSV of about 0.1 to about 1.0 (1 M NaCl, 1%, 25° C.), the prepolymer moiety of the graft copolymer particles being present on the surface of the particles,

said monomer (a) being a monomer having the formula

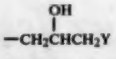


wherein R is hydrogen or methyl, Y is methyl or chlorine, and n is 0, 1, 2, or 3, said monomer (b) being selected from the group consisting of divinylbenzene; diallyl phthalate; ethylene glycol dimethacrylate; 1,3-butylene glycol dimethacrylate; 1,6-hexane diol dimethacrylate; polyethylene glycol dimethacrylate; polypropylene glycol dimethacrylate; trivinylbenzene; divinylnaphthalene; diallyl maleate; diallyl fumarate; trimethylol propane trimethacrylate; and pentaerythritol tetraacrylate, and said prepolymer (2) being the addition polymerization product of

(i) about 5 mole percent to 100 mole percent of a cationic monomer having the formula



wherein R_1 is hydrogen or methyl, R_3 is hydrogen, a C_1–C_4 alkyl,



where Y is hydroxyl or halogen,

and $—CH_2CH_2O)_nH$ where n is an integer 1 or more and X^- is an anion, and

(ii) from about 95 mole percent to 0 mole percent of at least one monoethylenically unsaturated amide monomer,

the amount of prepolymer (2) employed in preparing the graft copolymer particles being from about 2 parts to about 10 parts by weight for each 100 parts by weight of monomer (1) employed.

4,414,354

AQUEOUS POLYMERIC LATEX COATING COMPOSITIONS, PRODUCTS PRODUCED THEREBY, METHODS FOR PREPARING SUCH COMPOSITIONS, AND METHODS FOR USING SUCH COMPOSITIONS

Robert J. Slocombe, University City, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 807,267, Jun. 16, 1977, Pat. No. 4,374,670. This application Apr. 2, 1982, Ser. No. 364,703

Int. Cl.³ C08L *33/02*

U.S. Cl. 524—460 **35 Claims**

1. A liquid coating composition comprising

(a) colloidal polymer particles of at least one polymer capable of being deposited in the form of a film;

(b) a precursor of a material capable of disrupting the colloidal stability of the polymer particles to cause film formation when the coating composition is applied to a substrate; and

(c) a liquid dispersion medium.

4,414,355

WIRE COATING COMPOSITION

Richard J. Pokorny, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 14, 1981, Ser. No. 283,292

Int. Cl.³ C08L *27/12, 23/24;* **C08K** *5/02*

U.S. Cl. 524—462 **10 Claims**

1. A composition comprising an admixture of:

a. 35 to 70 weight percent of an anhydride copolymer which is the reaction product of:

(1) an alkyl or aryl substituted or unsubstituted unsaturated cyclic anhydride wherein each alkyl group contains up to 6 C atoms and the cyclic group contains 4 to 15 C atoms, and

(2) an unsaturated C_{10} to C_{24} aliphatic hydrocarbon;

b. 10 to 41 weight percent of a compatible flexibilizing polymer which is selected from polyisobutylene and polymers of ethylene copolymerized with vinyl acetate, acrylate esters, methacrylate esters and alpha-olefins, and

c. 10 to 40 weight percent of a hydrophobic, compatible, fluoroaliphatic radical-containing composition, said fluoroaliphatic radical being a monovalent, fluorinated, aliphatic radical having 5 to 14 carbon atoms which can be interrupted by divalent O atoms or trivalent N atoms bonded to C atoms; said fluoroaliphatic radical-containing composition being capable of providing water-repellancy to said admixture; and

d. up to 10 weight percent of a mercaptan compound.

4,414,356
TETRAFLUOROETHYLENE COPOLYMER

Rudolph H. Michel, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 310,068, Oct. 9, 1981, abandoned. This application Feb. 10, 1983, Ser. No. 465,467

Int. Cl.³ C08K *3/04*

U.S. Cl. 524—496 **1 Claim**

1. A composition consisting of an intimate admixture of a major portion of (a) a melt-fabricable tetrafluoroethylene copolymer resin having a melt viscosity between 1×10^4 and 1×10^7 poises at 380° C. and an average particle size of below 400 μm, and wherein the comonomers used to make the copolymer are perfluorinated ethylenically unsaturated organic copolymerizable monomers, and a minor portion of (b) graphite fibers that have not been treated by a process which increases surface oxygen and nitrogen content and which have an average of less than 6 atom % oxygen and less than 3 atom % nitrogen in the outermost 5 nm of fiber cross section.

4,414,357
POLYESTER OR ALKYD RESIN COMPOSITION CONTAINING ACRYLIC MICROGELS

Howard J. Wright, Kansas City, Mo.; David P. Leonard, Overland Park, Kans., and Roger A. Etzell, Farmington Hills, Mich., assignors to Glasurit America, Inc., Detroit, Mich.

Continuation-in-part of Ser. No. 98,115, Nov. 27, 1979, Pat. No. 4,290,932. This application Aug. 31, 1981, Ser. No. 297,631

Int. Cl.³ C08L *67/02, 67/08, 33/14, 33/02*

U.S. Cl. 524—513 **10 Claims**

1. A method of making a polyester or alkyd resin composition containing an acrylic microgel for use in paint systems to provide coatings of improved sag resistance which comprises preparing an aqueous, microgel emulsion by the emulsion polymerization in water of a mixture of ethylenically unsaturated monomers, at least one of said monomers being an acrylic or methacrylic acid, or an —OH substituted alkyl ester thereof, and containing a —COOH or —OH group, and at least another of said monomers being selected from an alkyl ester of an acrylic or methacrylic acid, styrene and α-methyl styrene and being free from —COOH and —OH groups, and a multifunctional crosslinking agent present in an amount of 5–70 percent by weight of the total weight of said ethylenically unsaturated monomers and crosslinking agent, removing water from the emulsion by coagulation and/or azeotropic distillation with an organic solvent in which the microgel is insoluble and which forms an azeotrope with water, and incorporating the microgel into a polyester or alkyd resin to provide said polyester or alkyd microgel resin composition wherein the amount of microgel solids is in the range of 5 to 15 percent by weight of the total resin solids.

4,414,358
FILLED COMPOSITIONS OF THERMOPLASTIC POLYAMIDE AND POLYESTER

Eric Nield, Watton-At-Stone, and Martin K. Thompson, Biggleswade, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Jun. 23, 1981, Ser. No. 276,641

Claims priority, application United Kingdom, Jul. 14, 1980, 8022949

Int. Cl.³ C08L *67/02, 77/06*

U.S. Cl. 524—538 **2 Claims**

1. A thermoplastic composition suitable for extrusion into extruded profiled sections comprising a blend of a linear polyamide, a linear polyester containing at least 80% by weight of ethylene terephthalate units, and an inorganic fibrous filler wherein the composition contains from 5 to 60% by weight of the composition of the inorganic fibrous filler, the weight ratio of polyamide to polyester is between 1:1 and 49:1, and wherein the polyamide contains at least 20 g equivalents of terminal amino groups per 10^6 g of polyamide in excess of the carboxyl groups.

4,414,359
DIENE-CONTAINING RUBBER COMPOSITIONS HAVING IMPROVED GREEN STRENGTH

David J. Dougherty, Akron; Binnur Günesin, Uniontown, both of Ohio, and John W. Spiewak, Webster, N.Y., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

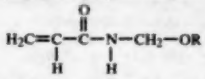
Division of Ser. No. 132,736, Mar. 24, 1980, Pat. No. 4,338,425. This application Jan. 25, 1982, Ser. No. 342,670

Int. Cl.³ C08F *220/58*

U.S. Cl. 524—555 **3 Claims**

1. A novel synthetic rubber composition having improved green strength formed by the emulsion copolymerization, at temperatures of about 0° to 30° C., of:

from about 0.5 to about 10 percent by weight of an N-(alkoxymethyl)acrylamide having the formula



wherein R is selected from the group consisting of straight and branched alkyl chains having from 1 to about 20 carbon atoms;

from about 10 to about 90 percent by weight of a conjugated diene compound having from about four to about 20 carbon atoms; and

from about 1 to about 90 percent by weight of a monomer containing a vinyl group selected from the group consisting of monovinyl aromatic compounds having from eight to about 20 carbon atoms and acrylic compounds having from three to about five carbon atoms; and,

thereafter compounded with

from about 20 to about 80 phr of carbon black,

from about 1 to about 40 phr of oil and

from about 1 to about 10 phr each of sulfur and an accelerator.

4,414,360
SPRAY BUFF REACTANT AND APPLICATION THEREOF

Walter J. Hackett, Westminster, and Peter E. Galena, Huntington Beach, both of Calif., assignors to Purex Corporation, Lakewood, Calif.

Division of Ser. No. 253,300, Apr. 13, 1981, Pat. No. 4,363,835. This application Nov. 9, 1981, Ser. No. 319,634

Int. Cl.³ C08L *25/14*

U.S. Cl. 524—560 **7 Claims**

1. A liquid solution containing a polymerized film forming agent and a cross linking ingredient for use in producing a toughened, mar-resistant floor film as by application to an already formed floor surface film and buffing of the floor surface film with the solution thereon in moist condition to heat the solution and surface film and produce crosslinking with the floor surface, said solution having the following composition:

	Ingredient	wt. percent range
(a)	water-emulsion acrylic polymer, styrene acrylic, vinyl acetate-acrylic polymer	5.0–90%
(b)	water soluble solvent	5.0–6.0%
(c)	non-ionic surfactant	0.1–2.0%
(d)	volatile amine	0.1–3.0%
(e)	humectant	0.1–4.0%
(f)	cross-linking agent selected from the group that consists of methylated melamine and sodium benzoate	0.1–10.0%
(g)	ammonia	0.1–2.0%
(h)	water	balance

4,414,361
ORGANIC POLYISOCYANATE-CYCLIC ALKYLENE CARBONATE ADHESIVE BINDER COMPOSITIONS

James M. Gaul, Exton, and Tinh Nguyen, Chaddsford, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 17, 1981, Ser. No. 293,564
The portion of the term of this patent subsequent to Aug. 17, 1999, has been disclaimed.
Int. Cl.³ C08L 97/00, 97/02
U.S. Cl. 524—702 25 Claims

1. An adhesive binder composition for the preparation of compression moldable lignocellulosic articles which comprises from about 20 to 95 percent by weight of an organic di- or polyisocyanate and from about 5 to 80 percent by weight of a liquid alkylene carbonate.

22. A method for the preparation of lignocellulosic composite articles comprising the steps of

(a) mixing together lignocellulosic particles and from about 1.5 to 12 weight percent based on oven dried lignocellulosic particles of an adhesive binder composition comprising from 20 to 95 weight percent organic di- and polyisocyanate and from about 5 to 80 weight percent liquid alkylene carbonate to form a moldable composition;

(b) introducing said moldable composition onto a metal mold, caul plate or platen which has been sprayed or coated with a release agent;

(c) compression shaping said composition at temperatures of between about 140° C. to 220° C. at pressures of from about 100 to 600 psi for a period of from about 1 to 10 minutes to form a composite article of desired shape and/or thickness; and

(d) thereafter releasing said lignocellulosic composite article from said metal mold, caul plate or platen.

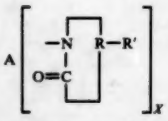
4,414,362
PREPARATION OF POLYAMIDES

Gerd M. Lenke, Mogadore, and Hubert J. Fabris, Akron, both of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Filed Mar. 4, 1982, Ser. No. 354,838
Int. Cl.³ C08G 69/14
U.S. Cl. 525—178 6 Claims

1. The method which comprises reacting together copolymerizable components consisting essentially of

I. At least one initiator compound having the formula



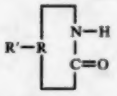
where A is $B(NHCO)_X$, $B(CO)_X$, —CO—, $-SO_2-$, —CS—,

$B(CS)_X$, $B(SO_2)_X$ and $B(PO)_{X/2}$, where B is a C_4 to C_{30}, or a C_6 to C_{15}, hydrocarbon radical selected from the group consisting of alkylene, cycloalkylene, alkcycloalkylene, arylene, alkarylene and aralkylene radicals and mixtures thereof, where X is 2 to 4 and where R is an alkylene radical of from 4 to 11 carbon atoms and R′ is hydrogen or an alkyl radical of from 1 to 4 carbon atoms,

II. at least one liquid nitrile copolymer having an average of from about 2 to 3 hydroxyl groups per molecule and an average molecular weight of from about 1,500 to 10,000, said copolymer being a copolymer of from about 95 to 60 parts by weight of at least one conjugated diene of from 4 to 6 carbon atoms and from 5 to 40 parts by weight of at least one nitrile selected from the group consisting of acrylonitrile and methacrylonitrile and

III. at least one lactam monomer in admixture with

IV. at least one anionic lactam polymerization catayst in an amount of from about 1 to 20 meq., or from about 5 to 15 meq., of lactamate anion per 100 grams of I, II and III, the molar amount of III being substantially greater than the molar amounts of I and II, at a time, temperature and pressure sufficient to form a solid polyamide V, the lactam of III and IV having the formula



where R is an alkylene radical of from 4 to 11 carbon atoms and R′ is hydrogen or an alkyl radical of from 1 to 4 carbon atoms, the equivalent ratio of the lactamate anion of the catalyst IV to the initiator compound I being from about 0.1:1 to 1:1 or from about 0.3:1 to 1:1, the equivalent ratio of the initiator compound I to the OH groups of the nitrile copolymer II being from about 0.8:1 to 4:1 or from about 1:1 to 3:1 and the nitrile copolymer II being used in an amount sufficient to provide from about 5 to 40% by weight of II copolymerized in the resulting polyamide V.

4,414,363
RUBBER COMPOSITION

Shuichi Akita; Takeshi Chida, both of Kamakura; Hiroyuki Watanabe, and Akio Ueda, both of Yokohama, all of Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan

Filed Jun. 16, 1982, Ser. No. 388,973
Int. Cl.³ C08L 9/00, 47/00
U.S. Cl. 525—237 10 Claims

1. A rubber composition comprising as main components (1) 25 to 75% by weight of at least one essentially amorphous rubber having a glass transition temperature of from −45° C. to 0° C., a Mooney viscosity (ML_{1+4}, 100° C.) of 20–200 and 1,2-linkages, 3,4-linkages or both 1,2- and 3,4-linkages and selected from the group consisting of an isoprene-butadiene copolymer rubber, polyisoprene rubber and mixtures thereof and (2) 75 to 25% by weight of at least one rubber selected from the group consisting of natural rubber; cis-1,4-polyisoprene rubber having a cis-1,4-linkage content and mixture thereof of at least 90 mole%, said composition having a value, defined by the following formula, of at least 10,

$$((R-53)+(S-100))$$

wherein R is a rebound (%) measured at 51° C. by a Dunlop Tripso meter for vulcanized product of said rubber composition, and a wet skid resistance index S which is determined at 19° C. by a portable skid tester for a vulcanized product of said rubber composition on a road surface defined by ASTM E-303-74.

4,414,364
STABILIZATION OF POLYESTER

Roy E. McAlister, 5285 Red Rock North, Phoenix, Ariz. 85018

Continuation of Ser. No. 32,633, Apr. 23, 1979, Pat. No. 4,243,779. This application Dec. 22, 1980, Ser. No. 218,501
Int. Cl.³ C08G 63/76
U.S. Cl. 525—437 51 Claims

1. A polyester resin having the phenolic hydrogen end atoms and/or alcoholic hydrogen end atoms replaced by stress corrodant preventive groups which are halohydrocarbon groups or halocarbon groups.

4,414,365
PROCESS FOR PRODUCING AN AROMATIC POLYESTER COMPOSITION

Hiroaki Sugimoto, Nara, and Makoto Hanabata, Takatsuki, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

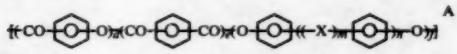
Filed Mar. 8, 1982, Ser. No. 356,241

Claims priority, application Japan, Mar. 16, 1981, 56-38308; Apr. 8, 1981, 56-53338; Aug. 4, 1981, 56-122861; Sep. 2, 1981, 56-138727

Int. Cl.³ C08G 63/60

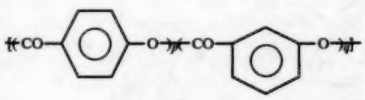
U.S. Cl. 525—437 **4 Claims**

1. A process for producing an aromatic polyester composition, which is characterized in that in producing an aromatic polyester represented by the general formula A,



A

(wherein X is an alkylene group having 1 to 4 carbon atoms, —O—, —SO_2—, —S—, or —CO—; m and n are each 0 or 1; the ratio of d to e is in the range of from 1:1 to 10:1; the ratio of e to f is in the range of from 9:10 to 10:9; and the substituents attached to the benzene ring are in para or meta position to one another), the polymerization is carried out using substantially no solvent, by the method of bulk polymerization at a temperature from about 200° C. to about 400° C., by mixing the reactants for forming the aromatic polyester with at least one polymer selected from the group consisting of polyalkylene terephthalates in the amount of about 5 to about 20% by weight of the composition ultimately produced, polyphenylene sulfides in the amount of about 5 to about 30% by weight of the composition ultimately produced, aromatic polysulfones in the amount of about 5 to 40% by weight of the composition ultimately produced, and aromatic polyesters represented by the general formula B,



B

wherein (p+q) is in the range of from 10 to 1,000 and $p/(p+q) \geqq 0.8$, in the amount of about 5 to about 50% by weight of the composition ultimately produced.

4,414,366
LOW COLOR COMPOSITIONS COMPRISING A CROSS-LINKED POLYCYANURATE POLYMER AND A THERMOPLASTIC POLYMER

Tse C. Wu; Dusan C. Prevorsek, and David H. Wertz, all of Morristown, N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 213,530, Dec. 5, 1980, Pat. No. 4,334,045. This application Jun. 4, 1982, Ser. No. 384,857

The portion of the term of this patent subsequent to Jun. 8, 1999, has been disclaimed.

Int. Cl.³ C08L 69/00, 67/02

U.S. Cl. 525—439 **18 Claims**

1. A process for preparing a cured composition which comprises:

(a) combining a purified monomeric aromatic dicyanate with an effective amount of a catalyst selected from the group consisting of manganese(II), silver(II), iron(III) bismuth-(III), indium(III) and hafnium(IV) salts and with a thermoplastic polymer;

(b) curing the aromatic dicyanate at at least one temperature at least about 150° C. and below about 200° C.; and

(c) further curing the aromatic dicyanate at at least one temperature between about 200° C. and about 300° C., for a time sufficient to cure the dicyanate without causing such color formation that the Yellowness Index of the cured composition exeeds about 30.

4,414,367
CURABLE MOLDING COMPOSITIONS

Hugh C. Gardner, Somerville, N.J., assignor to Union Carbide Corporation, Danbury, Conn.

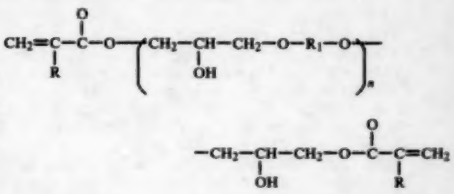
Filed Sep. 30, 1981, Ser. No. 307,213

Int. Cl.³ C08F 283/00

U.S. Cl. 525—531 **11 Claims**

1. A liquid homogeneous molding composition used for the rapid production of fiber-reinforced thermoset resin articles which composition comprises:

(a) a vinyl ester of the following formula:



wherein the R's are independently hydrogen or methyl, R_1 is the residue of a cycloaliphatic or aromatic diol and n has an average value of from 1 to about 5;

(b) a second crosslinkable oligomer containing two or more unsaturated groups selected from acrylate, or methacrylates; and

(c) a monoethylenically unsaturated monomer, wherein the weight ratio of (a) to (b) is greater than 0.3.

4,414,368
CHLOROSULFONATED POLYSULFONES AND DERIVATIVES THEREOF

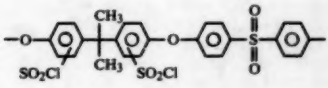
Myron J. Coplan, Natick; Chunghi H. Park, Sharon, and Samuel C. Williams, Lexington, all of Mass., assignors to Albany International Corp., Albany, N.Y.

Filed Dec. 27, 1982, Ser. No. 453,163

Int. Cl.³ C08G 65/48, 75/23

U.S. Cl. 525—534 **3 Claims**

1. A polysulfone sulfonyl chloride having recurring units of the formula:



4,414,369
CONTINUOUS PROCESS FOR THE PREPARATION OF POLYOLEFINS HAVING WIDELY DISTRIBUTED MOLECULAR WEIGHTS

Nobuyuki Kuroda, Yokohama; Tatsuo Horie, Tokyo; Kazuo Matsuura, Kawasaki; Kunimichi Kubo, Tokyo, and Mituji Miyoshi, Ninomiya, all of Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

Continuation of Ser. No. 911,761, Jun. 2, 1978, abandoned. This application Apr. 7, 1980, Ser. No. 138,104

Claims priority, application Japan, Aug. 17, 1977, 52-97747; Jan. 6, 1978, 53-204

Int. Cl.³ C08F 2/14, 4/66

U.S. Cl. 526—65 **13 Claims**

1. In a process for preparing polyolefins by polymerizing olefins in the presence of a solvent, hydrogen and a highly

active Ziegler-type catalyst comprising a transition metal compound supported on a solid carrier and an organometallic compound, in a plurality of reactors, to prepare polyolefins having widely distributed molecular weights, the improvement comprising:

(a) polymerizing olefins in a first stage reactor at a temperature of from 30° to 100° C. and a pressure of from 2 to 100 kg/cm^2, in the presence of a gas phase containing an inert gas in the upper portion of the reactor to form a polymerization reaction mixture comprising a dispersion of relatively high molecular weight polymer particles in the solvent, the concentration of said inert gas in said gas phase being from 40 to 99 mol %;

(b) continuously effecting the flow of the polymerization reaction mixture from the first stage reactor to a second stage reactor, the second stage reactor maintained at a pressure lower than that of the first stage reactor, whereby the flow of polymerization reaction mixture is driven by the pressure difference;

(c) subsequently polymerizing olefins in the second stage reactor, with agitation and beneath a gas phase containing hydrogen and olefins to form polymers having a relatively lower molecular weight, the olefin polymerization in said second stage reactor being effected by supplying hydrogen and additional olefin monomers; and

(d) continuously removing from the second stage reactor a polymerization reaction mixture containing polyolefins having widely distributed molecular weights, dispersed in the solvent.

4,414,370
PROCESS FOR CONTINUOUS BULK COPOLYMERIZATION OF VINYL MONOMERS

Archie E. Hamielec, Burlington, Canada; Grant P. Lawless, and Harold H. Schultz, both of Racine County, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Continuation of Ser. No. 223,597, Jan. 9, 1981, abandoned. This application Jan. 6, 1982, Ser. No. 337,343

Int. Cl.³ C08F *2/02, 212/08*

U.S. Cl. 526—88 **9 Claims**

1. Bulk polymerization process for preparing low molecular weight vinylic polymers having a dispersion index less than about 2 and a number average molecular weight from about 1000 to 6000 comprising the steps of continuously:

(a) charging a mixture of vinylic monomers into a continuous stirred reactor zone containing a molten resin mixture of unreacted vinylic monomers and said vinylic polymer product;

(b) maintaining the molten resin mixture at a reaction temperature from about 235° C. to 310° C.;

(c) maintaining a flow rate through said reaction zone sufficient (1) to provide a residence time of said charged vinylic monomer mixture in said reaction zone of at least about 2 minutes to provide a reaction product; and (2) to maintain a predetermined level of reaction mixture in said reaction zone; wherein said mixture of vinylic monomers comprises at least one monoalkenyl aromatic monomer and at least one acrylic monomer.

4,414,371
PROCESS FOR PRODUCING POLYOLEFIN GRANULES HAVING AN AVERAGE PARTICLE SIZE GREATER THAN 600 MICRONS

Harry J. Wristers, deceased, late of Baytown, Tex. (by Joy K. Wristers, executrix), assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Division of Ser. No. 225,213, Jan. 15, 1981, Pat. No. 4,330,433, which is a continuation-in-part of Ser. No. 125,400, Feb. 27, 1980, abandoned. This application Feb. 8, 1982, Ser. No. 347,826

Int. Cl.³ C08F *4/64*

U.S. Cl. 526—119 **30 Claims**

1. In a process for the polymerization of alpha-olefins wherein the alpha-olefin is contacted with a Ziegler-type catalyst system comprising titanium trihalide and an organometallic compound co-catalyst under alpha-olefin polymerization conditions, the improvement comprising employing titanium trihalide obtained by:

(a) adding an organometallic reducing compound with stirring to a solution of titanium tetrahalide in a suitable diluent at a temperature of about −50° C. to about +10° C. and in a mole ratio of between about 1:3 to about 1.2:1 and at a rate such that the reduction of titanium tetrahalide to titanium trihalide is about 0.03 to about 0.2 m moles per liter per second to obtain titanium trihalide solids product in the diluent having a narrow particle size distribution and an average particle size greater than about 20 microns;

(b) continuously and simultaneously adding with stirring to the titanium trihalide solids product in the diluent an organometallic reducing compound and titanium tetrahalide in a mole ratio of about 1:3 to about 1.2:1, the simultaneous addition being made at a rate such that the reduction of titanium tetrahalide to titanium trihalide is about 6×10^{-4} to about 0.02 m moles per liter per second m^2 of available preformed titanium trihalide surface area until solids product of desired size are obtained, and

(c) activating to violet-type crystalline titanium halide by one of heat treatment at an activating temperature, treating under activating conditions with chlorinated hydrocarbon or treating under activating conditions with titanium tetrachloride.

2. In a process for the polymerization of alpha-olefins wherein the alpha-olefin is contacted with a Ziegler-type catalyst system comprising titanium trihalide and an organometallic compound co-catalyst under alpha-olefin polymerization conditions, the improvement comprising employing titanium trihalide obtained by:

(a) adding an organometallic reducing compound with stirring to a solution of titanium tetrahalide in a suitable diluent at a temperature of about −50° C. to about +10° C. and in a mole ratio of between about 1.0:3.0 to about 1.2:1.0 and at a rate such that the reduction of titanium tetrahalide to titanium trihalide is about 0.03 to about 0.2 m moles per liter per second to obtain titanium trihalide solids product in the diluent having a narrow particle size distribution and an average particle size greater than about 20 microns;

(b) continuously, simultaneously and slowly adding with stirring to the titanium trihalide solids product in the diluent an organometallic reducing compound and titanium tetrahalide in a mole ratio of about 1.0:3.0 to about 1.2:1.0, the simultaneous addition being made at a rate such that the reduction of titanium tetrahalide to titanium trihalide is about 6×10^{-4} to about 0.02 m moles per liter per second per m^2 of available preformed titanium trihalide surface area until solids product of desired size are obtained;

(c) slowly raising the temperature in the range of about 60° C. to about 70° C. and recovering titanium trihalide solids product;

(d) contacting the titanium trihalide solids product with a minor amount of an alpha-olefin having from 2 to 8 carbon atoms under polymerization conditions to obtain a reduced titanium trihalide solids product containing about 1 to about 1,000 wt.% of prepolymerized alpha-olefin based on the weight of titanium trihalide, and

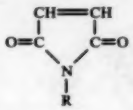
(e) treating said prepolymerized reduced solid with one of (a) a chlorinated hydrocarbon having at least 2 carbon atoms and a Lewis base complexing agent or (b) $TiCl_4$ and Lewis base complexing agent to convert the prepolymerized titanium trihalide reduced solid to a substantially non-friable highly active, crystalline prepolymerized trihalide composition.

4,414,372
PROCESS FOR PREPARING LIVING POLYMERS

William B. Farnham, and Dotsevi Y. Sogah, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Jun. 17, 1982, Ser. No. 389,111
Int. Cl.³ C08F 4/16
U.S. Cl. 526—190 29 Claims

1. Process of polymerizing the monomer selected from the group consisting of $CH_2{=}C(Y)X$,



and mixtures thereof wherein:

X is —CN, —CH=CHC(O)X′ or —C(O)X′;

Y is —H, —CH_3, —CN or —CO_2R, provided, however, when X is CH=CHC(O)X′, Y is —H or —CH_3;

X′ is —$OSi(R^1)_3$, —R, —OR or —NR′R″;

each R^1 is independently selected from $C_{1\text{-}10}$ alkyl and $C_{6\text{-}10}$ aryl or alkaryl;

R is $C_{1\text{-}20}$ alkyl, alkenyl, or alkadienyl; $C_{6\text{-}20}$ cycloalkyl, aryl, alkaryl or aralkyl; any of said groups containing one or more ether oxygen atoms within aliphatic segments thereof; and any of all the aforesaid groups containing one or more functional substituents that are unreactive under polymerizing conditions; and

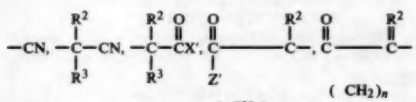
each of R′ and R″ is independently selected from $C_{1\text{-}4}$ alkyl

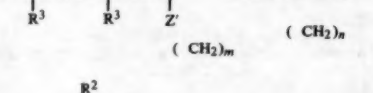
by contacting the one or more monomers under polymerizing conditions with:

(i) the initiator of the formula $(R^1)_3MZ$ wherein:

R^1 is as defined above;

Z is an activating substituent selected from the group consisting of





and mixtures thereof wherein:

X′ is as defined above;

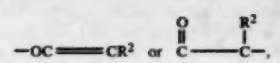
each of R^2 and R^3 is independently selected from H; $C_{1\text{-}10}$ alkyl and alkenyl; $C_{6\text{-}10}$ aryl, alkaryl, and aralkyl; any of said groups except H containing one or more ether oxygen atoms within aliphatic segments thereof; and any of all the aforesaid groups except H containing one or more functional substituents that are unreactive under polymerizing conditions; and

Z′ is O or N;

m is 2, 3 or 4;

n is 3, 4 or 5; and

M is Si, Sn, or Ge, provided, however, when Z is



M is Sn or Ge; and

(ii) a co-catalyst which is a source of bifluoride ions HF_2^{31} to produce "living" polymer having repeat units of the one or more monomers.

4,414,373
PROPYLENE-ETHYLENE COPOLYMER HAVING IMPROVED STRETCHABILITY

Akinobu Shiga; Kiyoshi Matsuyama; Masahiro Kakugo; Yukio Naito; Seiichiro Ima, and Katsuyoshi Yamashita, all of Niihama, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Division of Ser. No. 257,431, Apr. 24, 1981, Pat. No. 4,355,144, which is a continuation-in-part of Ser. No. 181,319, Aug. 25, 1980, abandoned. This application Jul. 16, 1982, Ser. No. 399,146
Claims priority, application Japan, Aug. 24, 1979, 54-108341
Int. Cl.³ C08F 210/16
U.S. Cl. 526—348 3 Claims

1. A propylene-ethylene copolymer having improved stretchability produced by polymerizing propylene and ethylene in the presence of hydrogen and a catalyst system comprising (A) titanium trichloride obtained by reducing titanium tetrachloride with an organoaluminum compound and reacting the reduced solid with an ether represented by the formula:

$$R^1{-}O{-}R^2$$

wherein R^1 and R^2 are each a straight chain, branched chain or cyclic alkyl group having 1 to 10 carbon atoms, and a halogen compound selected from the group consisting of

(i) halogen or interhalogen compounds of the formula:

$$X^1X^2_a$$

wherein X^1 and X^2 are each a chlorine, bromine or iodine atom and a is a number from 1 to 3;

(ii) titanium halides; and

(iii) organic halogen compounds, simultaneously or successively and (B) an organoaluminum compound, wherein ethylene is supplied with propylene to the polymerization system such that the ethylene concentration in the vapor phase of the system based on the total amount of propylene, ethylene and hydrogen in the vapor of the system is 0.15 to 1.5 mol% to obtain a propylene-ethylene copolymer having an ethylene content of from 0.1 to 1.0 wt%.

4,414,374
BUTADIENE-STYRENE-N,N-DIALKYLACRYLAMINE TERPOLYMERS

Binnur Gunesin, Uniontown, Ohio, and Adel E. Halasa, Safat, Kuwait, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 132,745, Mar. 24, 1980, abandoned. This application Jun. 1, 1981, Ser. No. 269,298
Int. Cl.³ C08F 212/08, 236/10, 220/54
U.S. Cl. 526—217 14 Claims

1. A terpolymer of improved green strength having its polymer molecules consisting essentially of 60–87 percent by weight of butadiene, 10–30 percent by weight of styrene and 1–15 percent by weight of an acrylamide of the formula:

$$CH_2{=}C(R')CON(RX)_2$$

wherein R′ represents hydrogen or methyl, R represents a

divalent saturated aliphatic group of 1–7 carbon atoms, X represents hydrogen, halogen, hydroxy or NR''_2, and R'' represents hydrogen or an alkyl group of 1–7 carbon atoms, said terpolymer being prepared by the steps of polymerizing in an aqueous emulsion at a temperature of 0°–35° C. a monomer mixture consisting essentially of 55–82 percent by weight of butadiene, 12–35 percent by weight of styrene and 5–30 percent by weight of said acrylamide and thereafter recovering the polymer product from the reaction mixture.

4,414,375

OXYGEN PERMEABLE CONTACT LENS MATERIAL COMPRISING COPOLYMERS OF MULTIFUNCTIONAL SILOXANYL ALKYLESTERS

Russell A. Neefe, 1441 Pinnacle Peak, DeSoto, Tex. 75115

Continuation-in-part of Ser. No. 185,000, Sep. 2, 1980, Pat. No. 4,306,042. This application Sep. 8, 1981, Ser. No. 300,189

Int. Cl.³ C08F *230/08*

U.S. Cl. 526—260 **6 Claims**

1. An oxygen permeable material for the manufacture of contact lenses formed by copolymerizing (a) from 5 to 90% by weight of a multifunctional siloxanyl alkyl ester, monomer having two or more α, ω terminally bonded through divalent hydrocarbon groups to an activated unsaturated group, (b) an effective amount of a copolymerizable monomer up to 90% by weight of an ester of acrylic or methacrylic acid or mixture thereof, or from (c) an effective amount of a copolymerizable monomer up an ester of itaconic acid, (d) from 0.5 to 40% by weight of a hydrophilic monomer for a surface wetting agent, and (e) from 0 to 20% by weight of an ester crosslinking agent in the presence of a free radical or a photo initiator.

4,414,376

RHODIUM- AND IRIDIUM-NITROGEN COMPLEX CATALYSTS

Allen R. Siedle, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 20, 1981, Ser. No. 246,104

Int. Cl.³ C08G *77/06*

U.S. Cl. 528—15 **10 Claims**

1. In a process for hydrosilation comprising the steps of:

causing a reaction to occur between a silicon-containing compound having at least one silicon-hydrogen bond and a compound having at least one pair of aliphatic unsaturated carbon atoms linked by multiple bonds in the presence of a catalytically effective amount of a rhodium- or iridium-nitrogen complex catalyst, optionally heating the resulting mixture, and recovering the resulting product,

the improvement comprising using as said catalyst a catalyst selected from the classes of complex compounds having the general formulae:

(a) monometallic complexes, $(L)MX(Y)_2$, and

(b) bimetallic complexes, $(L)[RhX(CO)_2]_2$,

wherein:

M is a rhodium or iridium metal atom,

L is a single or fused heterocyclic ligand comprising at least one five- or six-member ring, said ligand having 2 to 4 ring nitrogen atoms in the same ring,

Y is an uncharged ligand that fills one or two coordination positions of the metal atom, and,

X is independently Cl, Br, I, or CN.

4,414,377

EPOXIDE RESIN COMPOSITIONS CONTAINING ESTERS AS DILUENTS AND CURE ACCELERATORS

Christopher M. Andrews, Cambridge, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 26, 1982, Ser. No. 382,063

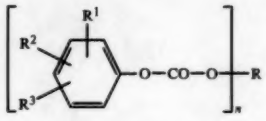
Claims priority, application United Kingdom, Jun. 3, 1981, 8117065

Int. Cl.³ C08G *59/68*

U.S. Cl. 528—88 **9 Claims**

1. A curable composition comprising

(a) an ester of the formula



where

n represents an integer of from 1 to 6,

R represents the residue, after removal of n hydroxy groups, of an alcohol or a phenol,

R^1, R^2, and R^3 may be the same or different and each represents a hydrogen atom, a halogen atom, or a straight chain or branched alkyl group having from 1 to 10 carbon atoms, with the proviso that one or two of R^1, R^2, and R^3 may alternatively represent an acyloxy group having from 1 to 10 carbon atoms,

(b) an amine having at least two hydrogen atoms directly attached to a nitrogen atom or to nitrogen atoms, which nitrogen atom or atoms is or are in turn directly attached to an aliphatic or cycloaliphatic carbon atom or atoms, and

(c) an epoxide resin.

4,414,378

GRANULAR OR POWDERY PHENOL-FORMALDEHYDE RESIN AND PROCESS FOR PRODUCTION THEREOF

Hiroaki Koyama, Kobe, and Shigeo Shimizu, Osaka, both of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed Apr. 15, 1982, Ser. No. 368,729

Claims priority, application Japan, Apr. 23, 1981, 56-60613

Int. Cl.³ C08G *8/10*

U.S. Cl. 528—137 **56 Claims**

1. A granular or powdery resin which is a condensation product of a phenol and formaldehyde, said granular or powdery resin being characterized by

(A) containing spherical primary particles and secondary particles resulting from the agglomeration of the primary particles, each of the particles having a particle diameter of 0.1 to 150 microns,

(B) having such a size that at least 50% by weight thereof can pass through a 100 Tyler mesh sieve,

(C) having a free phenol content, determined by liquid chromatography, of not more than 50 ppm,

(D) having a $D_{990\text{-}1015}/D_{1600}$ ratio of from 0.2 to 9.0 and a D_{890}/D_{1600} ratio of from 0.09 to 1.0 in its infrared absorption spectrum measured by a KBr tablet method, wherein D_{1600} represents the absorption intensity of an absorption peak at 1600 cm^{-1} assigned to benzene, $D_{990\text{-}1015}$ represents the highest absorption intensity of absorption peaks at 990 to 1015 cm^{-1} assigned to the methylol groups, and the D_{890} represents the absorption intensity of an absorption peak at 890 cm^{-1} assigned to a lone hydrogen atom of the benzene ring, and

(E) having a weight increase by acetylation, I defined by the following equation, of 23 to 40% by weight,

$$I=(W_1-W_o)/W_o\times 100\ (\%)$$

wherein W_o is the weight in grams of said resin before acetylation, and W_1 is the weight in grams of the resin after acetylation,

said acetylation being carried out by gradually heating 10 g of said resin from room temperature to 115° C. over the course of 45 minutes in 300 g of an acetylation bath consisting of 78% by weight of acetic anhydride, 20% by weight of acetic acid and 2% by weight of orthophosphoric acid and maintaining it at 115° C. for 15 minutes.

22. A process for producing a granular or powdery phenol-formaldehyde resin which comprises contacting a phenol with a hydrochloric acid-formaldehyde bath containing 5 to 28% by weight of hydrochloric acid and 3 to 25% by weight of formaldehyde with the total concentration of hydrochloric acid and formaldehyde being 15 to 40% by weight, while maintaining a bath ratio, defined by the quotient of the weight of the hydrochloric acid-formaldehyde bath divided by the weight of the phenol, of at least 8, said contacting being effected such that after contacting of the phenol with the bath, white suspended particles are formed and thereafter developed into a pink-colored granular or powdery solid.

4,414,379
GRANULAR OR POWDERY NITROGEN-CONTAINING PHENOL-ALDEHYDE COPOLYMER RESIN AND PROCESS FOR PRODUCTION THEREOF

Hiroaki Koyama, Kobe, and Shigeo Shimizu, Osaka, both of Japan, assignors to Kanebo Ltd. and Mitsubishi Chemical Industries Limited, both of Tokyo, Japan

Filed Jun. 16, 1982, Ser. No. 388,974
Claims priority, application Japan, Jul. 24, 1981, 56-115376
Int. Cl.³ C08G *14/06, 14/08, 14/10*
U.S. Cl. 528—137 **69 Claims**

1. A granular or powdery nitrogen-containing phenolaldehyde copolymer resin which is a condensation product of a phenol, a nitrogen-containing compound having at least two active hydrogen atoms and an aldehyde, said granular or powdery resin being characterized by

(A) containing spherical primary particles and secondary particles resulting from the agglomeration of the primary particles, each of said particles having a particle diameter of 0.1 to 100 microns,

(B) having such a size that at least 50% by weight thereof can pass through a 150 Tyler mesh sieve,

(C) having a free phenol content, determined by liquid chromatography, of not more than 50 ppm, and

(D) having a $D_{960\text{-}1020}/D_{1450\text{-}1500}$ ratio of from 0.1 to 2.0 in its infrared absorption spectrum measured by a KBr tablet method, wherein $D_{960\text{-}1020}$ represents the highest absorption intensity of absorption peaks at 960 to 1020 cm^{-1} assigned to the methylol groups, and $D_{1450\text{-}1500}$ represents the highest absorption intensity of absorption peaks at 1450 to 1500 cm^{-1} assigned to the aromatic double bond.

27. A process for producing a granular or powdery nitrogen-containing phenol-aldehyde copolymer resin, which comprises contacting a phenol and a nitrogen-containing compound having at least two active hydrogen atoms with a hydrochloric acid-formaldehyde bath containing 3 to 28% by weight of hydrochloric acid, 3 to 25% by weight of formaldehyde and 0 to 10% by weight of another aldehyde with the total concentration of hydrochloric acid and formaldehyde being 10 to 40% by weight, while maintaining a bath ratio, defined by the quotient of the weight of the hydrochloric acid-formaldehyde bath divided by the total weight of the phenol and the nitrogen-containing compound, of at least 8, said contacting being effected such that after contacting of the phenol and the nitrogen-containing compound with the bath, white suspended particles are formed and thereafter developed into a granular or powdery solid.

4,414,380
UNSUBSTITUTED BIPHENYLENE AS A CROSS-LINKING MONOMER

Raymond J. Swedo, Mount Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Oct. 29, 1982, Ser. No. 437,585
Int. Cl.³ C08G *63/66, 63/68*
U.S. Cl. 528—173 **11 Claims**

1. A polymer of the formula

$$[-P-CO-Q-CO-]_y-[-R-CO-Q-CO-]_z$$

where P, Q and R each is a divalent aromatic radical whose parent is:

for P, diphenylether or di(phenoxyphenyl)sulfone;

for Q, benzene;

and for R, biphenylene,

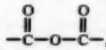
and where y and z each are integers, with z being from 1 up to about 5 and the average value y/z being between about 4 and about 49.

4,414,381
THERMOTROPIC POLYESTER ANHYDRIDE POLYMERS

Brian P. Griffin, St. Albans, and William A. MacDonald, Ware, both of England, assignors to Imperial Chemical Industries PLC, London, England

Filed Dec. 7, 1981, Ser. No. 328,395
Claims priority, application United Kingdom, Dec. 22, 1980, 8040953
Int. Cl.³ C08G *63/18, 63/60, 69/44*
U.S. Cl. 528—190 **7 Claims**

1. A melt-processable aromatic polyester anhydride characterised in that from 5 to 80% of the units linking the aromatic reactant residues in the polymer chain have the formula:



the remaining linkages between the residues of the aromatic reactants being of the formula:

optionally together with linkages of the formula:

substantially all of said remaining linkages being disposed in coaxial or parallel and oppositely directed manner with respect to the residues to which they are linked, the polyester anhydride having a solubility of less than 5% by weight in dimethyl sulphoxide at room temperature.

4,414,382
COPOLYESTERS DERIVED FROM 2,6-NAPHTHALENEDICARBOXYLIC ACID, TRANS-4,4'-STILBENEDICARBOXYLIC ACID AND ETHYLENE GLYCOL

John C. Morris, and Winston J. Jackson, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 30, 1982, Ser. No. 429,896
Int. Cl.³ C08G *63/18, 63/54*
U.S. Cl. 528—298 **4 Claims**

1. A copolyester containing repeating units prepared from about 90 to about 55 mol % 2,6-naphthalenedicarboxylic acid

or esters thereof, about 10 to about 45 mol % trans-4,4'-stilbenedicarboxylic acid or esters thereof and ethylene glycol, said copolyester having a melting point of about 350° C. or less and an inherent viscosity of about 0.4 or more determined at 25° C. in 40/35/25 (wt/wt/wt) p-chlorophenol/tetrachloroethane/phenol (PCLOL) at a concentration of 0.1 g/100 mL.

4,414,383

HIGH MOLECULAR WEIGHT POLYBENZIMIDAZOLE PREPARATION WITH PHOSPHORUS CONTAINING POLYMERIZATION CATALYST

Anthony B. Conciatori, Chatam; Eui W. Choe, Randolph, both of N.J., and Henry K. Hall, Jr., Tucson, Ariz., assignors to Celanese Corporation, New York, N.Y.

Filed May 24, 1982, Ser. No. 381,285
Int. Cl.³ C08G *73/18*
U.S. Cl. 528—336 **19 Claims**

1. A single stage melt polymerization process for the production of high molecular weight polybenzimidazole which comprises preparing a mixture of (1) at least one aromatic tetraamine containing two groups of amine substituents, said amine substituents in each group being in an ortho position relative to each other, and (2) at least one dicarboxylic acid; and heating the mixture above its melting temperature in contact with a phosphorus-containing polymerization catalyst corresponding to the formula:

where R is a radical selected from organic, halide and hydrogen substituents, with the proviso that not more than one R is hydrogen; and Y is an oxygen atom, and n is the integer zero or one.

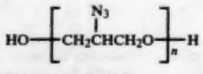
4,414,384

SYNTHESIS AND POLYMERIZATION OF 3-AZIDOOXETANE

Phillip T. Berkowitz, Woodbridge, Conn.; Kurt Baum, Pasadena, and Vytautas Grakauskas, Arcadia, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 14, 1982, Ser. No. 388,049
Int. Cl.³ C08G *65/22*
U.S. Cl. 528—417 **9 Claims**

1. A poly(3-azidotrimethylene ether) of the formula



wherein n is selected to provide an average molecular weight of from about 1500 about 5000 for the polymer.

4,414,385

CONCRETE COMPRISING SULFUR, CYCLOPENTADIENE OLIGOMERS, AGGREGATE AND GLASS FIBERS

Harold V. Swanson, Sparta, N.J., assignor to GHA Lock Joint, Inc., Wharton, N.J.

Filed Mar. 11, 1982, Ser. No. 356,972
Int. Cl.³ C08G *75/00*; C08L *81/00*
U.S. Cl. 524—494 **4 Claims**

1. A sulfur concrete coating composition comprising 77–88 weight percent sulfur, 3–10 weight percent of the combination of dicyclopentadiene and an oligomeric mixture of at least trimers of cyclopentadiene, 1–15 weight percent of at least one mineral aggregate material selected from the group consisting of limestone, quartz, silica, mica, basalt and fiberglass, and between 2 and 5 weight percent of glass fibers having a length between ¼ and 1½ inches.

4,414,386

PRECIPITATION OF POLYCYCLOOLEFINS HAVING HIGH BULK DENSITY

Parley C. Lane, Jr., Cuyahoga Falls, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed May 10, 1982, Ser. No. 376,369
Int. Cl.³ C08F *6/12*
U.S. Cl. 528—496 **10 Claims**

1. Process for precipitating a polymer from a cement comprising said polymer dissolved in a solvent, said process comprising mixing said cement with a sufficient amount of a nonsolvent alcohol containing 2 to 8 carbon atoms and water to precipitate said polymer thus forming a polymer slurry containing said polymer solids dispersed in a liquid medium containing said solvent, water, and said nonsolvent alcohol, and separating said polymer from said liquid medium, amount of water relative to said nonsolvent alcohol being different from the azeotropic composition of said alcohol and water but being in relative proportion necessary to produce product in the form of discrete particles having bulk density in excess of 0.08 g/cc that can be easily filtered and dried, and said polymer is a reaction product formed by ring opening polymerization of at least one norbornene-type monomer.

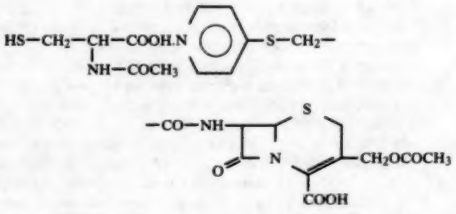
4,414,387

CEPHAPIRIN ACETYLCYSTEINATE HAVING ANTIBACTERIAL ACTIVITY

Renato Broggi, Via Bacchiglione 21, 20139 Milan, and Marco Falciani, Via De Ruggiero 85, 20142 Milan, both of Italy

Filed May 13, 1982, Ser. No. 377,837
Int. Cl.³ C07D *501/34*
U.S. Cl. 544—28 **1 Claim**

1. Cephapirin acetylcysteinate having formula



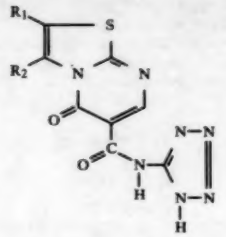
4,414,388

1-OXO-1H-THIAZOLO[3,2-a]PYRIMIDINE-2-CARBOXAMIDES

Saul B. Kadin, New London, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation of Ser. No. 96,631, Nov. 23, 1979, abandoned. This application Dec. 14, 1981, Ser. No. 330,578
Int. Cl.³ C07D *513/02*; A61K *31/505*
U.S. Cl. 544—48 **9 Claims**

1. A compound of the formula



and pharmaceutically-acceptable cationic salts thereof, wherein R_1 and R_2 taken together are alkylene of 3 to 9 carbon atoms or phenylalkylene of 9 to 11 carbon atoms, with the proviso that the ring system so formed is 5- to 8-membered and R_1 and R_2 taken separately are each hydrogen or alkyl of 1 to 5 carbon atoms.

4,414,389

4-SUBSTITUTED-PIPERIDINO CARBOXAMIDES

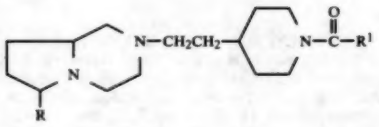
Meier E. Freed, Paoli, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed May 25, 1982, Ser. No. 381,673

Int. Cl.³ C07D *487/04;* A61K *31/495*

U.S. Cl. 544—349 **6 Claims**

1. A compound of the formula



in which

R is hydrogen, alkyl of 1 to 6 carbon atoms, phenyl or monosubstituted phenyl in which the substituent is alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, fluoro or chloro and said substituent is in the ortho or para position;

R^1 is 2-furanyl, 2-benzofuranyl, 2-thienyl or 2-pyridyl;

or a pharmaceutically acceptable salt thereof.

4,414,390

CARBOSTYRIL COMPOUNDS AND COMPOSITIONS CONTAINING SAME

Michiaki Tominaga; Yang Yung-hsiung; Hidenori Ogawa, and Kazuyuki Nakagawa, all of Tokushima, Japan, assignors to Otsuka, Pharmaceutical Co., Ltd., Tokyo, Japan

PCT No. PCT/JP81/00328, § 371 Date Jul. 12, 1982, § 102(e) Date Jul. 12, 1982, PCT Pub. No. W082/01706, PCT Pub. Date May 27, 1982

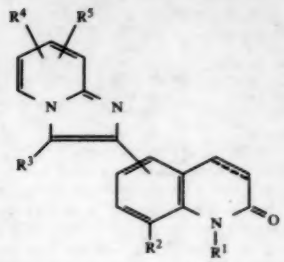
PCT Filed Nov. 11, 1981, Ser. No. 403,582

Claims priority, application Japan, Nov. 11, 1980, 55/159016; Dec. 18, 1980, 55/179950

Int. Cl.³ C07D *471/04*

U.S. Cl. 546—121 **17 Claims**

1. A carbostyril compound of the formula (I)



(I)

wherein R^1 represents a hydrogen atom, a lower alkyl group, a lower alkenyl group, a lower alkynyl group, or a phenyl-lower alkyl group;

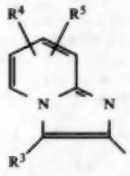
R^2 represents a hydrogen atom, a lower alkyl group, a lower alkoxy group, a halogen atom, or a hydroxy group;

R^3 represents a hydrogen atom, a lower alkyl group, a halogen atom, a nitroso group, an amino group which may be substituted with a lower alkyl group, a lower alkanoylamino group, an N,N-di-lower alkylaminomethyl group, a carbamoylmethyl group, a cyanomethyl group, or a carboxymethyl group;

R^4 and R^5, which may be the same or different, each represents a hydrogen atom, a halogen atom, a lower alkyl group, a hydroxy group, a lower alkoxy group, or a nitro group;

the bonding between the 3- and 4-positions of the carbostyril nucleus is a single bond or a double bond; and

the position at which the imidazopyridyl group of the formula



is attached to the carbostyril nucleus is the 5- or 6-position;

with the proviso that when the imidazopyridyl group is attached to the 5-position of the carbostyril nucleus, R^2 should not be a hydrogen atom, a lower alkyl group, or a halogen atom; or its pharmaceutically acceptable salt.

4,414,391

A PROCESS FOR PREPARING 2-PYRIDINYLOXYPHENOXY-LOWER-ALKANOATES

David Cartwright, Woodley, and Michael Turnbull, Lower Earley, both of England, assignors to Imperial Chemical Industries PLC, London, England

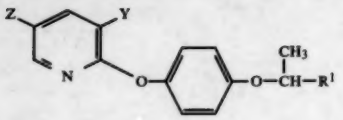
Filed May 4, 1981, Ser. No. 259,926

Claims priority, application United Kingdom, May 15, 1980, 8016028

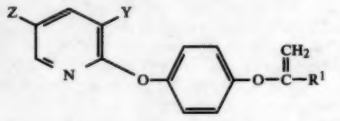
Int. Cl.³ C07D *213/64*

U.S. Cl. 546—302 **1 Claim**

1. A process for preparing a compound of general formula (I):



wherein Z is trifluoromethyl or difluoromethyl, Y is hydrogen or chlorine; and R^1 is optionally halo-, alkoxy- or hydroxy substituted alkoxycarbonyl of to 8 carbons; optionally halo- or methyl-substituted cyclohexyloxycarbonyl; (C_{3-6} alkenyl) oxycarbonyl; optionally halo- or methyl-substituted phenoxycarbonyl; or benzyloxycarbonyl, the phenyl moiety of which is optionally ring-substituted with halogen or methyl; or, in the case of a said compound wherein R^1 is carboxyl, alkali metal, alkaline earth metal or ammonium salt thereof; said process consisting essentially of the step of selectivity reducing a compound of general formula (II):



wherein Z, Y and R^1 are as defined above, and if necessary, when R^1 in said compound of general formula (I) so obtained is carboxy, esterifying the compound to give a compound of general formula (I) wherein R^1 is as defined above other than carboxy or alkali metal, alkaline earth metal or ammonium salt thereof, or when R^1 in said compound of general formula (I) so obtained is as defined above other than carboxy, hydrolysing the compound to give a compound of general formula (I) wherein R^1 is carboxy or alkali metal, alkaline earth metal or ammonium salt thereof, said reduction involving hydrogenation of said compound (II) in the presence of a palladium or platinum catalyst, the reduction being performed until the alkene double bond is saturated after which the catalyst is removed and the product obtained corresponding to compound (I) is purified.

4,414,392

HERBICIDAL COMPOSITIONS AND PYRAZOLE DERIVATIVES

Takuo Konotsune, Hiromachi, and Katsuhiko Kawakubo, Yasumachi, both of Japan, assignors to Sankyo Company, Ltd., Tokyo, Japan

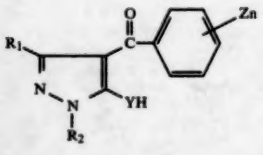
Division of Ser. No. 953,357, Oct. 23, 1978, abandoned, which is a continuation of Ser. No. 838,083, Sep. 30, 1977, Pat. No. 4,146,726, which is a division of Ser. No. 558,682, Mar. 17, 1975, Pat. No. 4,063,925. This application Mar. 20, 1980, Ser. No. 132,101

Claims priority, application Japan, Mar. 28, 1974, 49-34939

Int. Cl.³ C07D *231/20*

U.S. Cl. 548—105 **13 Claims**

1. A salt of a metal ion, complex ion or ammonium ion and a compound having the formula



wherein

R_1 represents hydrogen atom or a lower alkyl group,

R_2 represents a lower alkyl group or a lower alkenyl group,

n is an integer of 2 or 3,

Z represents a halogen atom, nitro group or a lower alkyl group, and Z's may be the same or different, and

Y represents an oxygen atom.

4,414,393

ULTRAVIOLET-ABSORBING STABILIZERS SUBSTITUTED BY AN ALIPHATIC HYDROXYL GROUP

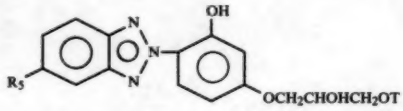
Martin Dexter, Briarcliff Manor, and Roland A. E. Winter, Armonk, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 5, 1981, Ser. No. 318,648

Int. Cl.³ C07D *249/20*

U.S. Cl. 548—260 **3 Claims**

1. A compound having the formula



where T is alkyl of 4 to 14 carbon atoms, and R_5 is hydrogen or chloro.

4,414,394

TRICYCLIC IMIDYL DERIVATIVES

Hans Zweifel, Basel; Walter Schilling, Himmelried; Angelo Storni, Rheinfelden, and Daniel Bellus, Rieben, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

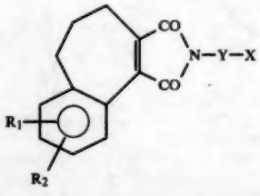
Division of Ser. No. 183,905, Sep. 4, 1980, Pat. No. 4,337,200, which is a continuation-in-part of Ser. No. 9,985, Feb. 6, 1979, Pat. No. 4,242,264. This application Feb. 16, 1982, Ser. No. 349,419

Claims priority, application Switzerland, Feb. 8, 1978, 1400/78

Int. Cl.³ C07D *209/94*

U.S. Cl. 548—451 **5 Claims**

1. A compound of the formula



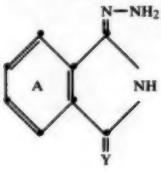
in which R and R_1 independently of one another are hydrogen, halogen, alkyl having 1 to 4 carbon atoms or methoxy, Y is alkylene having 1 to 30 carbon atoms, cycloalkylene having 5 or 6 carbon atoms, methylenebis(cyclohexylene), arylene having 6 to 10 carbon atoms, aralkylene having 7 or 8 carbon atoms or alkylarylene having 7 or 8 carbon atoms; or said arylene substituted by one alkyl of 1 to 4 carbon atoms, by one alkoxy of 1 to 4 carbon atoms or by one nitro, and X is —OH.

4,414,395
PROCESS FOR THE MANUFACTURE OF HYDRAZONO-ISOINDOLINES

Abul Iqbal, Ettingen, and Paul Lienhard, Frenkendorf, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 6, 1981, Ser. No. 241,142
Claims priority, application Switzerland, Mar. 13, 1980, 1974/80
Int. Cl.³ C07D *209/44*
U.S. Cl. 548—471 **5 Claims**

1. A process for the manufacture of a 1-hydrazono-isoindoline of the formula



wherein

Y is a methine radical of the formula

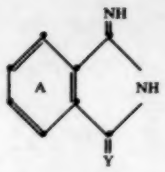
wherein R is an alkoxycarbonyl, alkylcarbamoyl, carbamoyl or sulfamoyl group, a benzylcarbamoyl group, a phenylcarbamoyl or phenylsulfamoyl group which is unsubstituted or substituted by halogen atoms or alkyl groups of 2 to 6 carbon atoms, or by nitro, cyano or trifluoromethyl groups, or is a naphthylcarbamoyl group which is unsubstituted or substituted by chlorine atoms, or a phenylsulfonyl group or a radical of the formula

wherein V is an oxygen or a sulfur atom or an imino group, Y_1, Y_2 are hydrogen or halogen atoms, alkyl or alkoxy groups, each of 1 to 4 carbon atoms, or nitro groups,

or a methine radical derived from a heterocyclic compound containing an active methylene group,

or Y is an imine radical =N—E where E is the residue of an aromatic or heteroaromatic amine,

the ring A is unsubstituted or is substituted by 1 to 4 chlorine atoms, 1 to 2 alkyl or alkoxy groups, each of 1 to 4 carbon atoms, a phenyl, phenoxy or nitro group, an alkanoylamino group containing 2 to 6 carbon atoms, or a benzoylamino group, consisting essentially of reacting an iminoisoindoline of the formula



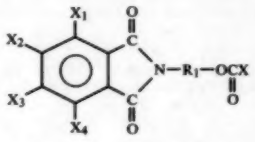
with hydrazine or hydrazine hydrate, in a polar solvent, at a temperature from 10° C. to 40° C.

4,414,396
POLYHALOPHTHALIMIDOALKYL-FUNCTIONAL CARBONATES AND HALOFORMATES

Nicodemus E. Boyer, Schaumburg, Ill., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 7, 1982, Ser. No. 337,660
Int. Cl.³ C07D *209/48*
U.S. Cl. 548—478 **5 Claims**

1. A compound represented by the structural formula:



wherein:

a. R_1 is straight chain or branched chain alkylene having from about 2 to about 5 carbon atoms,

b. X is chloro or bromo, and

c. X_1, X_2, X_3, and X_4 are each independently hydrogen, chloro or bromo, with the proviso that at least three of X_1, X_2, X_3, and X_4 are each independently chloro or bromo.

4,414,397
PRODUCTION OF ALKENYL SUBSTITUTED ALIPHATIC DICARBOXYLIC ANHYDRIDES

Justin C. Powell, Fairfax, Va., assignor to Texaco Inc., White Plains, N.Y.

Filed Jan. 7, 1982, Ser. No. 337,564
Int. Cl.³ C07D *307/60*
U.S. Cl. 549—255 **17 Claims**

1. The method of preparing a product alkenyl-substituted aliphatic dicarboxylic acid anhydride, by reaction of components consisting essentially of olefin oligomer and unsaturated dicarboxylic acid anhydride in the presence of 1,3-dibromo-5,5-dialkyl substituted hydantoin catalyst, which comprises

maintaining at 150° C.-300° C. a reaction mixture containing a molten olefin oligomer of molecular weight M_n of 500-30,000, containing 5-200 ppm of 1,3-dibromo-5,5-dialkyl-substituted hydantoin catalyst wherein the alkyl substituents contain a total of 2-21 carbon atoms;

adding an unsaturated aliphatic dicarboxylic acid anhydride to said reaction mixture containing said molten olefin oligomer over a reaction period during which said olefin oligomer and said unsaturated aliphatic dicarboxylic acid anhydride react to form product alkenyl-substituted aliphatic dicarboxylic acid anhydride;

controlling the rate of addition of said unsaturated aliphatic dicarboxylic acid anhydride whereby unreacted unsaturated aliphatic dicarboxylic acid anhydride in said reaction mixture is present in amount less than about its maximum solubility in said reaction mixture at the conditions of reaction and the reaction mixture is maintained as a

substantially homogeneous reaction mixture of one phase; and

recovering product alkenyl-substituted aliphatic dicarboxylic acid anhydride containing decreased quantities of unsaturated aliphatic dicarboxylic acid anhydride decomposition products.

4,414,398

DEHYDRATION OF MALEIC ACID TO FORM MALEIC ANHYDRIDE

Roland Kotwica, Pont-Sainte-Maxence, France, assignor to Societe Chimiques des Charbonnages, Paris le Defense, France

Filed Jun. 11, 1981, Ser. No. 272,819

Claims priority, application France, Jun. 13, 1980, 80 13117

Int. Cl.³ C07D *307/60*

U.S. Cl. 549—262 **8 Claims**

1. In a continuous process for the dehydration of maleic acid to form maleic anhydride, comprising a first stage of concentrating an aqueous solution of maleic acid, and a second stage of dehydrating the concentrated maleic acid into maleic anhydride, each of the two stages being effected by evaporation as a thin film, the improvement wherein the evaporation in both of said stages is conducted as a thin film undisturbed by mechanical agitation in at least one static tubular evaporator having a plurality of tubes, said tubular evaporator having an upper and lower end wherein the liquid is distributed on the inner surface of the tubes of the said upper end of at least one static tubular evaporator and wherein both liquid and evaporated vapor flow downwardly in the same direction and are both withdrawn from said lower end, and wherein the stage of concentration of the maleic acid solution is conducted at a temperature of between 120° and 140° C. and a pressure of between 200 and 500 mm of mercury and with a residence time of between 1 and 60 seconds to obtain a maleic acid concentration of between 85 and 95% by weight; and where the stage of dehydration of the concentrated maleic acid is conducted at a temperature of between 140° and 160° C. at a pressure of between 150 and 250 mm of mercury and with a residence time of between 1 and 60 seconds.

4,414,399

5/6 CARBOXYPHTHALIDES

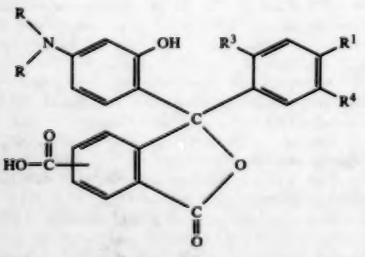
Paul J. Schmidt, Sharonville, and William M. Hung, Cincinnati, both of Ohio, assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 281,027, Jul. 6, 1981, which is a continuation-in-part of Ser. No. 135,855, Mar. 31, 1980, Pat. No. 4,298,215, which is a continuation-in-part of Ser. No. 39,017, May 14, 1979, Pat. No. 4,274,660. This application Apr. 15, 1983, Ser. No. 485,313

Int. Cl.³ C07D *307/88*

U.S. Cl. 549—309 **7 Claims**

1. A 3-[2-hydroxy-4-(R)$_2$aminophenyl]-3-(2-R^3-4-R^1-5-anilinophenyl)-5/6-carboxyphthalide of the formula



wherein:

R represents a non-tertiary C_1 to C_4 alkyl;

R^1 represents hydrogen or a non-tertiary C_1 to C_4 alkyl;

R^3 represents a non-tertiary C_1 to C_4 alkoxy;

R^4 represents $-N(R^5)(R^6)$ in which

R^5 represents hydrogen, non-tertiary C_1 to C_{18} alkyl, benzyl or benzyl substituted by halo, nitro, non-tertiary C_1 to C_4 alkyl or non-tertiary C_1 to C_4 alkoxy, and

R^6 represents hydrogen, phenyl, non-tertiary C_1 to C_{18} alkyl, benzyl, benzyl substituted by halo, nitro, non-tertiary C_1 to C_4 alkyl or non-tertiary C_1 to C_4 alkoxy or lower alkanoyl.

4,414,400

PROCESS FOR THE PRODUCTION OF TETRONIC ACID

Raimund Miller, Hackensack, N.J., and Leander Tenud, Visp, Switzerland, assignors to Lonza Ltd., Gampel, Switzerland

Filed Jun. 14, 1982, Ser. No. 388,432

Claims priority, application Switzerland, Jun. 17, 1981, 3982/81

Int. Cl.³ C07D *307/60*

U.S. Cl. 549—313 **13 Claims**

1. Process for the production of tetronic acid converting a 4-haloacetoacetic alkyl ester into the corresponding 4-tertiarybutoxyacetoacetic alkyl ester and converting the latter ester by cyclizing ether cleavage into tetronic acid.

4,414,401

PROCESS FOR SEPARATING AND RECOVERING METAL CATALYSTS

Willi Wintermeyer, Seeheim-Jugenheim; Rolf Wittmann, Mühltal, and Jürgen Butzke, Dieburg, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft Mit Beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Oct. 29, 1981, Ser. No. 316,381

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1980, 3040631

Int. Cl.³ C07D *407/00, 317/00*

U.S. Cl. 549—370 **9 Claims**

1. In a process for producing diacetone ketogulonic acid, wherein diacetone sorbose is oxidized in aqueous alkaline solution in the presence of a suspended nickel hydroxide catalyst, and the gelatinous catalyst is separated from diacetone ketoglulonic acid and separately recovered, the improvement comprising separating the gelatinous nickel hydroxide catalyst by a process comprising circulating the aqueous reaction mixture in contact with the surface of a microfiltration membrane at a flow rate such that its Reynolds number is at least about 1000, the pressure drop across the membrane being about 0.5–100 bar; periodically reversing the pressure drop across the membrane for a time interval sufficient to flush occluded catalyst out of the pores of the membrane by the brief reverse flow of permeate; and separately recovering a permeate containing diacetaone ketogulonic acid, and a retentate of concentrated, substantially fully active nickel hydroxide catalyst which is uncontaminated by filter aids and suitable for recycling directly to the oxidation without regeneration.

4,414,402

[2S-(2β,2S*, 3β)]-3-AMINOTETRAHYDRO-5-METHOXY-α-METHYL-2-FURANMETHANOL, AN INTERMEDIATE IN THE CHIRAL SYNTHESIS OF AMINO SUGARS

Milan R. Uskokovic, Upper Montclair, and Peter M. Wovkulich, Nutley, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 326,731, Dec. 2, 1981, Pat. No. 4,376,207, which is a division of Ser. No. 179,126, Aug. 18, 1980, Pat. No. 4,324,726, which is a division of Ser. No. 60,261, Jul. 25, 1979, Pat. No. 4,252,964. This application Sep. 27, 1982, Ser. No. 423,924

Int. Cl.³ C07D *307/12*

U.S. Cl. 549—475 **1 Claim**

1. The compound [2S-(2β,2S*,3β)]-3-aminotetrahydro-5-methoxy-α-methyl-2-furanmethanol.

4,414,403

BRANCHED POLYCARBOSILANES AND THEIR USE IN THE PRODUCTION OF SILICON CARBIDE

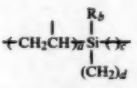
Curtis L. Schilling, Jr., Croton-On-Hudson, N.Y.; Thomas C. Williams, Ridgefield, Conn., and John P. Wesson, Croton-On-Hudson, N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 272,900, Jun. 18, 1981, abandoned, which is a continuation-in-part of Ser. No. 209,151, Nov. 21, 1980, abandoned. This application Mar. 23, 1982, Ser. No. 361,106

Int. Cl.³ C07F 7/08

U.S. Cl. 556—430 20 Claims

1. A branched polycarbosilane comprising more than one unit of the formula



wherein R is lower alkyl, a is 0 or 1, b is 0–3, c is 0–4, d is 0–4, and a+b+c+d totals 4, with the provisos that, in different units, a, b, c, d, and R may differ, but that, in at least one unit, a+d must total 1 or more and, in at least 1 unit, a+c+d must total 3 or more.

4,414,404

PROCESS FOR PRODUCING N-ACYL-D,L-PHENYLALANINE ESTER

Jerry M. Roper, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Mar. 11, 1982, Ser. No. 357,232

Int. Cl.³ C07C 101/08

U.S. Cl. 560—41 13 Claims

1. A process for preparing a racemic mixture of N-acyl-D,L-phenylalanine ester by reacting the azlactone of N-acyl-acetaminocinnamic acid with hydrogen at a hydrogen pressure of at least about 100 psig at a temperature within the range of from about 50°–200° C. in the presence of a nickel hydrogenation catalyst, a lower alkanol and an alkali metal or an alkaline earth metal alkoxide.

4,414,405

PROCESS FOR PREPARING ESTERS OF 2-(6'METHOXY-2'NAPHTYL)-PROPIONIC ACID VIA REARRANGEMENT OF NEW KETALS OF 2-HALO-1-(6'-METHOXY-2'-NAPHTYL)-PROPAN-1-ONE AND NEW ESTERS OF 2-(5'-BROMO-6'-METHOXY-2'-NAPHTYL)-PROPIONIC ACID THUS PREPARED

Claudio Giordano, Monza; Aldo Belli, Novara; Fulvio Uggeri, Codogno, and Giovanni Villa, Monticello Brianza, all of Italy, assignors to Blaschim S.p.A., Milan, Italy

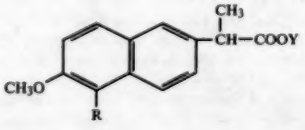
Filed Feb. 20, 1981, Ser. No. 236,513

Claims priority, application Italy, Feb. 26, 1980, 20187 A/80

Int. Cl.³ C07C 69/76

U.S. Cl. 560—56 1 Claim

1. Process for preparing a compound having the formula:

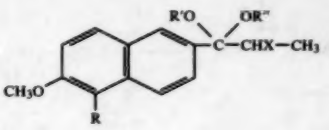


wherein

R is selected from the group consisting of a hydrogen and a bromine atom; and

Y is selected from the group consisting of an alkyl radical having from 1 to 6 carbon atoms, a haloalkyl radical having from 2 to 6 carbon atoms, and a benzyl radical;

which comprises the rearrangement of a compound having the formula:



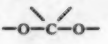
wherein

R has the above mentioned meaning;

R' is selected from the group consisting of an alkyl radical having from 1 to 6 carbon atoms and a benzyl radical;

R'' is selected from the group consisting of an alkyl radical having from 1 to 6 carbon atoms and a benzyl radical; or

R' and R'', together, are an alkylene radical having from 2–6 carbon atoms which, together with the



group, forms a heterocyclic ring; and

X is a halogen atom

in the presence of a catalytic amount of a Lewis acid.

4,414,406

CLASS OF FRIEDEL-CRAFTS CATALYSTS

Ellis K. Fields, River Forest, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 191,855, Sep. 29, 1980, abandoned. This application Sep. 18, 1981, Ser. No. 303,220

Int. Cl.³ C07C 69/76

U.S. Cl. 560—109 14 Claims

1. A process for the production of polybenzyls by aralkylation of aromatic hydrocarbons which comprises contacting the same or different aromatic halides in the presence of a molybdenum contacting catalyst selected from the group consisting of MoS_2, $MoSi_2$, $MoTe_2$, and $MoSe_2$, wherein the reaction is conducted at a temperature of about 60° to 250° C. and the catalyst concentration is in the range of about 0.01 to about 15% weight of reactants.

4,414,407

FLUORO-PROSTAGLANDINS AND PROCESS FOR THEIR PREPARATION

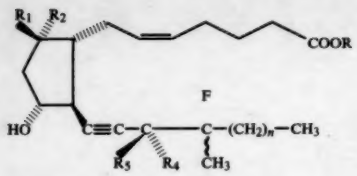
Renato Pellegata, and Carmelo Gandolfi, both of Milan, Italy, assignors to Farmitalia Carlo Erba, Milano, Italy

Continuation of Ser. No. 163,164, Jun. 26, 1980, abandoned, which is a continuation of Ser. No. 92,854, Nov. 9, 1979, abandoned, which is a division of Ser. No. 944,614, Sep. 21, 1978, abandoned, which is a continuation of Ser. No. 779,632, Mar. 21, 1977, abandoned, which is a continuation of Ser. No. 667,261, Mar. 15, 1976, abandoned. This application Dec. 7, 1981, Ser. No. 328,245

Int. Cl.³ C07C 177/00

U.S. Cl. 424—305 8 Claims

1. A 16-fluoro prostaglandin analog of the formula:



wherein R is hydrogen, a C_1–C_{12} alkyl group or a cation of a pharmaceutically acceptable base;

one of R_1 and R_2 is hydrogen and the other is hydroxy or an alkanoyloxy group containing up to 6 carbon atoms, a benzoyloxy or a p-phenylbenzoyloxy group, or R_1 and R_2 taken together from an oxo group;

one of R_4 and R_5 is hydroxy and the other is hydrogen; and n is zero or an integer of 1 to 6.

4,414,408

PHENOLIC ANTIOXIDANTS

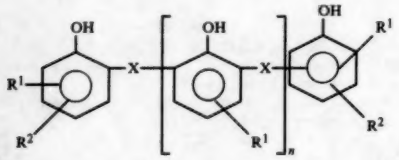
Kirkwood S. Cottman, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 192,583, Sep. 30, 1980, abandoned, which is a continuation of Ser. No. 24,752, Mar. 28, 1979, abandoned, which is a continuation of Ser. No. 525,440, Nov. 20, 1974, abandoned. This application Feb. 16, 1982, Ser. No. 349,358

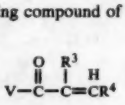
Int. Cl.³ C07C *69/604*

U.S. Cl. 560—144 **7 Claims**

1. Compounds comprising the reaction product of a polyphenolic compound having the formula

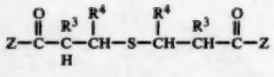


with an ester forming compound of the general formula



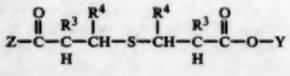
(B)

which are then joined through a sulfur atom to form compounds having a general formula selected from the group consisting of



(I)

and



(II)

wherein Z is a phenoxy radical derived from a polyphenolic compound having structural formula (A) and wherein R^1 and R^2 are the same or different radicals selected from the group consisting of hydrogen, alkyl radicals containing from 1 to 16 carbon atoms, cycloalkyl radicals containing from 5 to 8 carbon atoms, aralkyl radicals containing from 7 to 12 carbon atoms and unsubstituted aryl radicals containing from 6 to 12 carbon atoms, X is the same or different radical selected from the group consisting of (1) cyclic dienes with non-adjacent carbon to carbon double bonds within the ring structure having from 5 to 20 carbon atoms from which the divalent species are prepared and (2) divalent species selected from the group consisting of —S—,

—O—, —CH_2— and —S—S— and wherein n is selected from the group consisting of 0 and integers from 1 to 5 and wherein R^3 is selected from the group consisting of hydrogen and alkyl radicals having from 1 to 2 carbon atoms, R^4 is selected from the group consisting of hydrogen, alkyl radicals having from 1 to 4 carbon atoms, aralkyl radicals having from 7 to 9 carbon atoms, substituted or unsubstituted aryl radicals having from 6 to 8 carbon atoms and wherein V is selected from the group consisting of chlorine, iodine and bromine.

4,414,409

PALLADIUM SULFONATE CATALYST SYSTEMS FOR CARBONYLATION OF OLEFINS

Francis J. Waller, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Dec. 21, 1981, Ser. No. 333,178

Int. Cl.³ C07C *51/14, 67/38*

U.S. Cl. 560—233 **14 Claims**

1. In an improved catalytic carbonylation process for preparing acids and esters by reacting an olefinically unsaturated compound, carbon monoxide and a hydroxylic compound, at about 50° to about 150° C., in the presence of a catalyst comprising an organic phosphine liganded palladium compound and an acid, wherein the improvement comprises using a perfluorosulfonic acid as the acid.

4,414,410

PROCESS FOR PREPARING ALKYL ESTERS BY HOMOLOGATION OF THE NEXT LOWER ALKYL ESTER

Jiang-Jen Lin, Round Rock, and John F. Knifton, Austin, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jan. 13, 1982, Ser. No. 339,232

Int. Cl.³ C07C *67/36, 69/003, 69/14*

U.S. Cl. 560—265 **24 Claims**

1. A process for preparing a higher carbon number alkyl ester of an unsubstituted aliphatic carboxylic acid or an aromatic carboxylic acid selected from benzoic acid, naphthoic acid, toluic acid and phenylacetic acid, or an unsubstituted alicyclic monocarboxylic acid by homologation of the corresponding next lower carbon number alkyl ester which comprises contacting the lower alkyl ester with carbon monoxide and hydrogen in the presence of catalytic amounts of an iodide- or iodine-free catalyst composition comprising a ruthenium-containing compound, a cobalt-containing compound and a quaternary phosphonium salt or base, and heating the resulting mixture to a temperature above 150° C. and increasing the pressure to above 500 psi for a sufficient time to produce the desired alkyl ester.

4,414,411

PROCESS FOR PREPARING UNSATURATED ACIDS WITH MO, V, TI-CONTAINING CATALYSTS

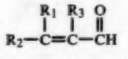
Harry J. Decker, and Erlind M. Thorsteinson, both of Charleston, W. Va., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 408,416, Oct. 23, 1973, abandoned. This application May 5, 1980, Ser. No. 146,655

Int. Cl.³ C07C *51/25, 57/055*

U.S. Cl. 562—534 20 Claims

1. A process for the production of unsaturated aliphatic carboxylic acid by vapor phase catalytic oxidation of the corresponding unsaturated aliphatic aldehyde with molecular oxygen in the presence of steam, said aldehyde having the structure



wherein R_1 is H or a C_1 to C_6 alkyl radical and R_2 and R_3 are the same or different and are H or CH_3, which comprises contacting the reaction mixture with a catalytically effective amount of a calcined oxidation catalyst consisting essentially of the elements Mo, V, Ti, and X in the ratio

$$Mo_aV_bTi_cX_d$$

wherein X is selected from the group consisting of Fe, Cu, Co, Cr, and/or Mn

a is 12,

b is 1 to 14

c is 0.1 to 12, and

d is 0.01 to 1.0.

4,414,412

PROCESS FOR THE PREPARATION OF UNSATURATED CARBOXYLIC ACIDS BY THE CATALYTIC OXIDATION IN GASEOUS PHASE OF THE CORRESPONDING ALDEHYDES AND CATALYST USED IN SAID PROCESS

Giordano DeAlberti, Besnate; Romano Covini; Mario Padovan, both of Milan; Giancarlo Battiston, Baranzate, and Guido Petrini, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Nov. 7, 1975, Ser. No. 629,985

Claims priority, application Italy, Nov. 12, 1974, 29321 A/74

Int. Cl.³ C07C *51/26;* B01J *23/22, 23/28, 23/30*

U.S. Cl. 562—535 8 Claims

1. A process for the preparation of acrylic or methacrylic acid by reacting in vapor phase acrolein or methacrolein with oxygen or with an oxygen-containing gas at from 200° to 350° C., in the presence of a catalyst represented by the empirical formula:

$$Mo_{12}V_aW_bX_cO_d$$

wherein

X is selected from the group consisting of Ti, Ti+Cr, Ag+Cr, La+Cr, and wherein:

a is from 0.5 to 10;

b is from 0.5 to 8;

c is from 0.1 to 3 for Ag and from 0.3 to 4 in the other cases; and

d satisfies the valency requirements of the other elements.

4,414,413

1,2-DI[N,N-BIS(2-FLUORO-2,2-DINITROETHYL)CARBAMYL]HYDROZINE

Michael E. Sitzmann, Adelphi, and William H. Gilligan, Ft. Washington, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 228,032, Jan. 23, 1981. This application Dec. 21, 1981, Ser. No. 332,797

Int. Cl.³ C07C *133/02*

U.S. Cl. 564—35 1 Claim

1. 1,2-di[N,N-bis(2-fluoro-2,2-dinitroethyl)carbamyl]hydrazine.

4,414,414

4,4'-DITHIODIANIL

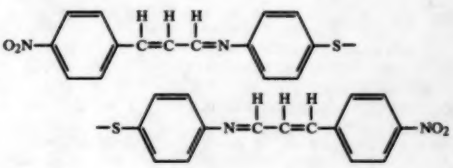
Thaddeus J. Novak, Bel Air, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 14, 1981, Ser. No. 301,507

Int. Cl.³ C07C *149/42*

U.S. Cl. 564—271 1 Claim

1. The 4,4'-dithiodianil compound of the formula:



4,414,415

PROCESS FOR THE MANUFACTURE OF 2,6-DICHLORO-4-NITROANILINE, AND THE COMPOUND OBTAINED BY THIS PROCESS

Michel Aubouy, Paris; Pierre Hamel, Cleon, and Marc Molin, Neuilly-sur-Marne, all of France, assignors to Rhone-Poulenc Agrochimie, Lyons, France

Filed May 13, 1981, Ser. No. 263,131

Claims priority, application France, Jun. 6, 1980, 80 13021

Int. Cl.³ C07C *85/24*

U.S. Cl. 564—412 5 Claims

1. A process for the manufacture of 2,6-dichloro-4-nitroaniline by the chlorination, with chlorine gas, of para-nitroaniline in an aqueous solution of hydrochloric acid, at the boil, wherein the reaction is carried out at a temperature of 95° to 110° C., the concentration of hydrochloric acid in the medium being between 4 and 7.5 N.

4,414,416

CERTAIN DIACETYL-AMINO-PHENOLIC DERIVATIVES

Richard A. Raphael; Stephen C. Eyley, and Stephen C. W. Coltman, all of Loughborough, England, assignors to Fisons Limited, London, England

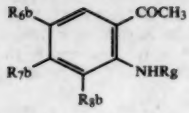
Division of Ser. No. 212,331, Dec. 2, 1980, Pat. No. 4,328,341. This application Jan. 20, 1982, Ser. No. 340,974

Claims priority, application United Kingdom, Dec. 7, 1979, 7942248

Int. Cl.³ C07C *87/50;* C07D *311/24*

U.S. Cl. 564—443 3 Claims

1. A compound having the formula



in which

R_6b and R_7b together form a chain —COCH=C—(COOH-)—O—, or a pharmaceutically acceptable salt or a lower alkyl ester thereof, or form the pair of groups $—COCH_3$ and —OM, respectively,

Rg and R_8b, which may be the same or different, each represent hydrogen, alkyl or alkenyl, the alkyl and alkenyl groups each containing up to eight carbon atoms, and

M is hydrogen or an alkali metal,

provided that when Rg is hydrogen, R_6b is acetyl and R_8b is hydrogen, then R_7b is other than —OH.

4,414,417

PROCESS FOR THE CATALYTIC REDUCTION OF UNSATURATED KETONES

Giovanni Mestroni; Grazia Zassinovich, and Annamaria Camus, all of Trieste, Italy, assignors to Montedison, S.p.A., Milan, Italy

Continuation of Ser. No. 226,381, Jan. 19, 1981, abandoned. This application Dec. 30, 1981, Ser. No. 335,744

Claims priority, application Italy, Jan. 23, 1980, 19391 A/80

Int. Cl.³ C07C *45/62*

U.S. Cl. 568—315 **12 Claims**

1. A process for the reduction by the transfer of hydrogen from alcohols to linear, homo- and hetero-cyclic α-,β-unsaturated ketones, said reduction being catalyzed by iridium complexes, characterized in that an aliphatic, alicyclic primary or secondary alcohol is reacted with a ketone selected from the group consisting of benzylideneacetone, dibenzylideneacetone, chalcone, carvone and 2-methylcyclohexene-1-one in the presence of a complex catalyst of iridium having the formula:

$$[Ir\ Chel\ (L-L)]^+\ X^-$$

wherein:

Chel is a chelating bidentate nitrogenous compound selected from the group consisting of 2,2'-dipyridyl; 4,4'-dimethyl-2,2'-dipyridyl; 1,10-phenantroline; 5,6-dimethyl-1,10-phenantroline; 4,7-dimethyl-1, 10-phenantroline and 3,4,7,8-tetramethyl-1, 10-phenantroline;

L-L is a molecule of an unsubstituted non-conjugated acylic or cyclic diolefin, or two molecules of an unsubstituted acyclic or cyclic mono-olefin;

X represents an anion selected from the group consisting of Cl^-, Br^-, I^-, PF_6^-, BF_4^-, ClO_4^- and $B(C_6H_5)_4$;

and in the presence of small amounts of a mineral alkali at a temperature ranging from about 20° C. to the boiling temperature of the reaction mass, in an inert atmosphere.

4,414,418

PROCESS FOR THE PRODUCTION OF DIMEDONE

Pavel Lehky, Naters, Switzerland, assignor to Lonza Ltd., Gampel, Switzerland

Filed May 19, 1982, Ser. No. 379,718

Claims priority, application Switzerland, May 27, 1981, 3473/81

Int. Cl.³ C07C *45/48*

U.S. Cl. 568—346 **16 Claims**

1. Process for the production of dimedone from isophorone, comprising converting isophorone in a solvent present in an amount sufficient to act as a solvent with ozone present in an amount sufficient to effect the isophorone-conversion into an ozone-addition product, said solvent being a hydrocarbon a halogenated hydrocarbon, an ester solvent or an alcohol having 1 to 6 carbon atoms, heating the ozone-addition product in the presence of an acid which is present in an effective amount to a temperature of 20° to 150° C., adding an alcohol at the latest after the formation of the ozone-addition product when the solvent is a non-alcohol solvent whereby the intermediate product 3,3-dimethyl-5-oxo-hexanoic acid ester forms, the alcohol being present in an amount sufficient to form said ester, the alcohol corresponding to the ester radical, isolating the 3,3-dimethyl-5-oxo-hexonic acid ester, and converting said ester by treatment with an alkali alcoholate present in an amount sufficient to effect the ester-conversion in an anhydrous milieu into dimedone.

4,414,419

STABILIZATION OF ALDEHYDES

Jürgen Weber, Oberhausen; Volker Falk, Voerde, and Claus Kniep, Oberhausen, all of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 28, 1980, Ser. No. 115,781

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1979, 2905267; May 3, 1979, 2917789

Int. Cl.³ C07C *47/058, 47/02*

U.S. Cl. 568—421 **15 Claims**

1. A process for stabilizing a saturated aliphatic aldehyde having 3 to 14 carbon atoms against polymerization and autocondensation comprising adding an effective amount of triethanolamine or dimethylethanolamine to said aldehyde.

4,414,420

ALDEHYDE-ETHERS

Norman Harris, Stockton-on-Tees; Alan J. Dennis, Middlesbrough, and George E. Harrison, Billericay, all of England, assignors to Davy McKee (Oil & Chemicals) Limited, United Kingdom

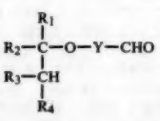
Division of Ser. No. 139,591, Apr. 11, 1980, Pat. No. 4,383,125. This application Apr. 7, 1982, Ser. No. 366,166

Claims priority, application United Kingdom, Apr. 11, 1979, 7912849

Int. Cl.³ C07C *45/50*

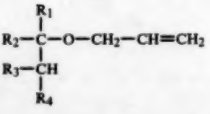
U.S. Cl. 568—454 **13 Claims**

1. A process for the preparation of an aldehyde-ether of the general formula:



(I)

wherein R_1 and R_2 each, independently of the other, represent a C_1 to C_4 alkyl radical, and R_3 and R_4 each, independently of the other, represent a hydrogen atom or a C_1 to C_3 alkyl radical, or wherein R_1 represents a C_1 to C_4 alkyl radical, R_2 and R_3 together with the carbon atoms to which they are attached form a 5-membered or 6-membered cycloaliphatic ring, and R_4 represents a hydrogen atom or a C_1 to C_3 alkyl radical, and wherein Y represents $—CH_2—CH_2—CH_2—$ or $—CH_2—CH(CH_3)—$, which comprises contacting a compound of the general formula:



(IV)

wherein R_1, R_2, R_3 and R_4 are as defined above, with hydrogen and carbon monoxide under hydroformylation conditions and in the presence of a catalytic amount of a hydroformylation catalyst.

4,414,421

PROCESS FOR THE PREPARATION OF GLYCOL ALDEHYDE

Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed May 26, 1982, Ser. No. 382,029

Claims priority, application United Kingdom, Aug. 3, 1981, 8123691

Int. Cl.[3] **C07C** *45/49, 45/75*

U.S. Cl. 568—462 **7 Claims**

1. In a process for the preparation of glycol aldehyde, by reacting formaldehyde with hydrogen and carbon monoxide at a temperature in the range from about 30° to 200° C. and pressure in the range from about 5 to about 200 bars in the presence of a rhodium and/or a cobalt-containing catalyst, and water the improvement which comprises that sulphur dioxide, is present during said reaction.

4,414,422

PURIFICATION OF 4,4-DIHYDROXYBIPHENYL

Mary L. Ash; Timothy R. Diephouse, and Robert M. Strom, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 10, 1982, Ser. No. 376,867

Int. Cl.[3] **C07C** *37/70*

U.S. Cl. 568—724 **8 Claims**

1. A process for purifying crude 4,4′-dihydroxybiphenyl comprising contacting without substantially dissolving the crude 4,4′-dihydroxybiphenyl in a system comprising water and a water-miscible organic compound selected from the group consisting of acetone, and C_{1-6} alkanols and diols at an elevated temperature and for a time sufficient to remove substantial quantities of phenyl-substituted phenols and sulfur-containing impurities and thereafter recovering the purified 4,4′-dihydroxybiphenyl.

4,414,423

MULTISTEP OLIGOMERIZATION PROCESS

Stephen J. Miller, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Sep. 25, 1981, Ser. No. 305,679

Int. Cl.[3] **C07C** *2/02*

U.S. Cl. 585—517 **10 Claims**

1. A process for preparing high boiling hydrocarbons from normally gaseous olefins, comprising:

(a) contacting a feed comprising normally gaseous olefins with a first catalyst comprising an intermediate pore size silicaceous crystalline molecular sieve substantially free of hydrogen transfer activity selected from silicalite, an organosilicate disclosed in RE 29,948 and CZM, to produce a first effluent comprising normally liquid olefins; and

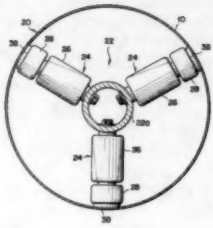
(b) contacting at least part of the normally liquid olefins contained in said first effluent with a second catalyst comprising an intermediate pore size silicaceous crystalline molecular sieve substantially free of hydrogen transfer activity under oligomerization conditions to produce a second effluent wherein said second effluent comprises oligomers of said normally liquid olefins and wherein at least some of said oligomers are liquids under said oligomerization conditions.

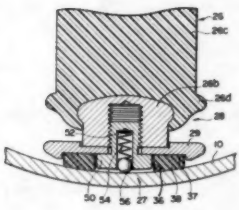
ELECTRICAL

4,414,424
GAS-INSULATED BUS BAR

Tetsuhiko Mizoguchi, and Akio Koyama, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 19, 1981, Ser. No. 312,726
Claims priority, application Japan, Oct. 20, 1980, 55-149299[U]
Int. Cl.³ H02G 5/06; H01B 9/04
U.S. Cl. 174—28 3 Claims





1. A gas-insulated bus bar, which comprises:

a case filled with highly pressurized electrically insulating gas;

bus conductors supported in the case substantially coaxially therewith; and

a plurality of support arms fitted to the bus conductors to let them extend substantially coaxially with the case,

wherein each support arm comprises:

a proximal support member which is provided with an electrically insulating member, one end of which is fitted to the bus conductor, and a low voltage shield fitted to the other end of said electrically insulating member; and

a distal support member which is provided with an electric connection member which is electrically connected to the low voltage shield and elastically and slidably contacts the inner peripheral wall of the case, a metal member which contacts the end of the low voltage shield and is provided with a cavity open to the inner peripheral wall of the case, and a sliding member which is set between the cavity and the inner peripheral wall of the case to enclose the electric connection member and which is prepared from an elastic electrically insulating material and slidably contacts the inner peripheral wall of the case; and

further wherein the electric connection member comprises:

a screw which is threadedly inserted into the lower voltage shield substantially toward the center of the case and is provided with a hole which is formed in substantially the same direction as that in which the thread is threadedly inserted and extends radially of the case;

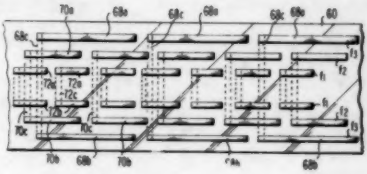
elastic means held in the radially extending hole; and

a contact ball which is received in the radially extending hole and is made to project from said radially extending hole by the elastic means to be pressed against the inner peripheral wall of the case.

4,414,425
BROADBAND NON-CONTACTING RF SHIELDING GASKET

Bruce F. Bogner, Mt. Holly, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 28, 1981, Ser. No. 306,355
Int. Cl.³ H05K 9/00
U.S. Cl. 174—35 GC 12 Claims



1. An RF gasket for providing electrical shielding in the interface area between two conductive surfaces without direct electrical contact between the two surfaces, said gasket being effective to substantially reduce the flow of energy in a given frequency band, through said interface area, said gasket comprising:

a plurality of stub-pairs, each stub-pair comprising: a first elongated conductive stub-like member; a second elongated stub-like member; and means for electrically joining one end of said first stub-like member to one end of said second stub-like member;

means for positioning said plurality of stub-pairs such that said first stub-like member in each pair is spaced and substantially parallel to one of said conductive surfaces and said second stub-like member is spaced and substantially parallel to the other of said conductive surfaces;

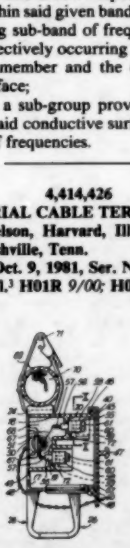
said plurality of stub-pairs being dimensioned to fall into sub-groups, each stub-like member in each stub-pair of each sub-group forming an open circuit at the other end thereof and being dimensioned such that each open circuit is transformed into a low impedance in a sub-band of frequencies within said given band, each sub-group having a corresponding sub-band of frequencies, said low impedance paths effectively occurring between said one end of each stub-like member and the corresponding adjacent conductive surface;

each stub-pair in a sub-group providing a low impedance path between said conductive surfaces in the corresponding sub-band of frequencies.

4,414,426
AERIAL CABLE TERMINAL

Frederick W. Burtelson, Harvard, Ill., assignor to Northern Telecom Inc., Nashville, Tenn.

Filed Oct. 9, 1981, Ser. No. 310,398
Int. Cl.³ H01R 9/00; H02G 15/10
U.S. Cl. 174—59 25 Claims



1. An aerial cable terminal, comprising:

a housing, the housing including top and bottom walls, end walls, and a dividing wall extending from said top wall to divide the interior of the housing into a back compartment and a front compartment;

apertures in said dividing wall and a conductor terminal positioned in each aperture, each conductor terminal having a rear portion extending into said back compartment and a front portion extending into said front compartment;

said rear portion of each conductor terminal adapted for connection of a stub cable conductor thereto;

said front portion of each conductor terminal having a hole therethrough, transverse to the longitudinal axis of the conductor terminal, for reception of a drop-wire conductor;

said conductor terminals arranged in pairs, the holes in said front portions of a pair inclined downwardly and inwardly towards each other;

shrouds extending forward from said dividing wall and surrounding each conductor terminal, and a channel in each shroud, the channel aligned with said hole in the related conductor terminal;

access means in one end wall for entry of a stub cable;

a back cover in the back of said housing for access to said back compartment and a removable front cover closing the front of said front compartment.

4,414,427

CABLE ENTRY PORT MEANS FOR ELECTRICAL OUTLET BOX

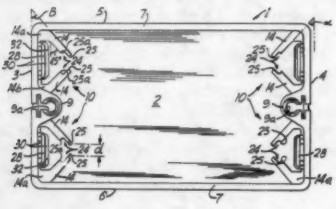
Thomas S. Slater, Port Washington, and Wade R. Bowden, Jr., Northport, both of N.Y., assignors to Slater Electric Inc., Glen Cove, N.Y.

Division of Ser. No. 22,993, Mar. 22, 1979, abandoned, which is a continuation-in-part of Ser. No. 879,767, Feb. 21, 1978, Pat. No. 4,366,343. This application Apr. 27, 1981, Ser. No. 257,815

The portion of the term of this patent subsequent to Dec. 8, 1998, has been disclaimed.

Int. Cl.³ H02G *3/08*

U.S. Cl. 174—65 R **6 Claims**



1. In an electrical outlet box having a wall structure providing front-to-rear wall means and a bottom wall interconnected therebetween, the front-to-rear wall means and bottom wall defining a chamber within the wall structure which opens through the front of the box, and wherein the improvement comprises cable entry port means on said wall structure for the passage of an electrical power cable into said box chamber, said cable entry port means including:

at least one aperture in a first portion of said wall structure, each said aperture being formed at the intersection of said front-to-rear wall means and said bottom wall and including:

a first generally rectangular opening extending upwardly into said front-to-rear wall means from said bottom wall, and

a second generally V-shaped opening converging inwardly into said bottom wall from the longitudinally extending side rims of said first rectangular openings, said generally V-shaped opening facing said front of said box;

closure panel means depending from the rim of said rectangular opening portion of said aperture and extending angularly inwardly from the plane of said aperture,

said closure panel means including a pair of opposed closure panel members converging angularly inwardly toward each other from said longitudinally extending side rims of said first rectangular portion of said aperture,

the convergent inner free ends of said converging pair of closure panel members extending generally perpendicular to said bottom wall and being separated from each other by a distance which is less than the narrowest dimension of said electrical power cable, and

the front facing converging edges of said closure panel members extending downwardly from said front-to-rear walls toward said convergent free ends at an acute angle;

said free end portions of said closure panel members adapted to deflect away from each other upon passage of said cable into said aperture and to thereafter resistingly bear against the installed cable; and

a third closure panel member extending inwardly from the inside surface of said front-to-rear wall means at an acute angle thereto and terminating closely adjacent to the front facing convergent edges of said converging closure panel members, said third closure panel member substantially closing said generally V-shaped opening formed between said opposed converging closure panel members facing said front of said box.

4,414,428

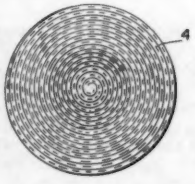
EXPANDED METAL CONTAINING WIRES AND FILAMENTS

William K. McDonald, Salem, Oreg., assignor to Teledyne Industries, Inc., Albany, Oreg.

Continuation-in-part of Ser. No. 42,893, May 29, 1979, Pat. No. 4,262,412. This application Jan. 30, 1981, Ser. No. 229,981

Int. Cl.³ H01B *5/00*

U.S. Cl. 174—126 S **20 Claims**



1. An extruded metal wire having at least two layers coaxially laminated upon and to each other and wherein at least one layer is foraminous metal.

4,414,429

END CAP ATTACHMENT TO LAMINATED INSULATOR CORE

Alexandre Kaczerginski, Bellerive sur Allier, and Michel Willem, Vichy, both of France, assignors to Societe Anonyme dite: Ceraver, Paris, France

Filed Jan. 27, 1982, Ser. No. 343,290

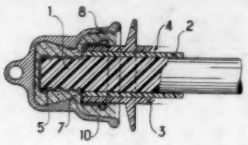
Claims priority, application France, Feb. 5, 1981, 81 02206

Int. Cl.³ H01B *17/02, 17/38*

U.S. Cl. 174—179 **10 Claims**

1. An insulator comprising a pair of fixing caps and an elongate core which includes a rod made of agglomerated fibers, one of said caps being fitted at each end of the core, and a protective covering of insulating material surrounding the rod between the caps, and each cap having a core-receiving recess supplied with embedding substance, wherein at least one end of the core has undercut fixing zones, and a ductile metal cup

is crimped directly onto said end, said cup having a rim which is sealed to said covering of insulating material, said cup itself



being embedded in the corresponding core-receiving cap recess by means of said embedding substance.

4,414,430

DECODERS FOR FEEDING IRREGULAR LOUDSPEAKER ARRAYS

Michael A. Gerzon, Oxford, England, assignor to National Research Development Corporation, London, England

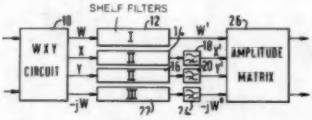
PCT No. PCT/GB81/00018, § 371 Date Sep. 24, 1981, § 102(e) Date Sep. 24, 1981, PCT Pub. No. WO81/02502, PCT Pub. Date Sep. 3, 1981

PCT Filed Feb. 12, 1981, Ser. No. 305,623

Claims priority, application United Kingdom, Feb. 23, 1980, 8006174

Int. Cl.³ H04R *5/04*

U.S. Cl. 381—22 **24 Claims**



1. A decoder for feeding an array of m (being three or more) pairs of diametrically opposite loudspeakers, the array being an irregular array, that is an array in which the loudspeakers are disposed in positions other than at the corners of a regular polygon or regular solid or a rectangle or rectangular cuboid, each loudspeaker being disposed substantially at an equal distance r from a common reference point, and the ith pair of loudspeakers having cartesian coordinates (x_i, y_i, z_i) and $(-x_i, -y_i, -z_i)$ with respect to rectangular cartesian axes x, y and z at the reference point, said decoder comprising input means for receiving coded input signals representative of the desired acoustical pressure and velocity at the reference point and for outputting signals W, X, Y and, for a three-dimensional loudspeaker layout, Z, filter means connected to the input means for producing, from said signals W, X, Y, Z, a signal W′ representative of the desired acoustical pressure at the reference point and independent of i, signals X′, Y′ and, where appropriate, Z′ representative of the components of the desired acoustical velocity along the x, y and z axes and independent of i, and a signal jW_i'' bearing a 90° phase relationship to W′ for all encoded sound directions, and an amplitude matrix circuit connected to the filter means for producing, from the output signals of said filter means, signals S_i^+ and S_i^- to be fed to the loudspeakers of each pair, the sum of which is the same for all pairs of loudspeakers, where

$$S_i^+ = W' + \alpha_i X' + \beta_i Y' + \gamma_i Z' - \delta_i W_i''$$

$$S_i^- = W' - \alpha_i X' - \beta_i Y' - \gamma_i Z' + \delta_i W_i''$$

where α_i, β_i, γ_i and δ_i are real gain coefficients such that α_i, β_i and γ_i substantially satisfy the following matrix equation:

$$KM = \frac{k\,mr\,I}{\sqrt{2}}$$

where K is the m×3 matrix:

$$\begin{pmatrix} x_1 & x_2 & x_m \\ y_1 & y_2 \cdots & y_m \\ z_1 & z_2 & z_m \end{pmatrix},$$

M is the 3×m matrix of coefficients:

$$\begin{pmatrix} \alpha_1 & \beta_1 & \gamma_1 \\ \alpha_2 & \beta_2 & \gamma_2 \\ \cdot & & \\ \cdot & & \\ \cdot & & \\ \alpha_m & \beta_m & \gamma_m \end{pmatrix},$$

I is the identity matrix:

$$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix}$$ for a three-dimensional loudspeaker layout

or

$$\begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 0 \end{pmatrix}$$ for a two-dimensional, horizontal loudspeaker layout,

and k is a positive real constant which may be frequency dependent.

4,414,431

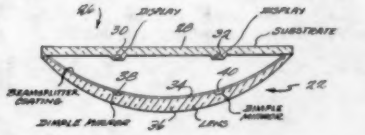
METHOD AND APPARATUS FOR DISPLAYING SPEECH INFORMATION

Michael L. McCartney, Durham, N.C., assignor to Research Triangle Institute, Research Triangle Park, N.C.

Filed Oct. 17, 1980, Ser. No. 198,068

Int. Cl.³ G10L *1/00*; G02B *17/00*

U.S. Cl. 381—48 **11 Claims**



1. A wearable display system for producing a virtual image for viewing by a person comprising:

a pair of spectacles adapted to be worn by the person and having at least one lens;

a transparent plate which supports and subtends said lens;

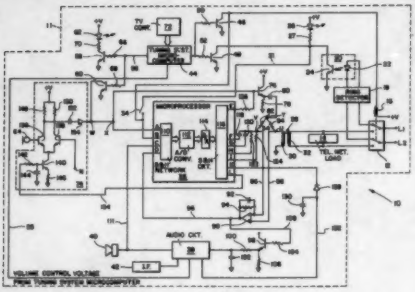
at least one lamp array mounted paraxially with the viewer's line of sight on said plate for producing one of a plurality of images each indicating a group of speech sounds and projecting said one image forward of the viewer; and

at least one light transmitting mirror mounted adjacent said lamp array on said lens for reflecting said one image back to the viewer.

4,414,432
PSEUDO-FULL DUPLEX TELEVISION/TELEPHONE LOUDSPEAKER SYSTEM

Peter C. Skerlos, Arlington Heights, and Thomas J. Zato, Palatine, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Sep. 21, 1981, Ser. No. 304,226
Int. Cl.³ H04M *11/08*
U.S. Cl. 179—2 TV **17 Claims**

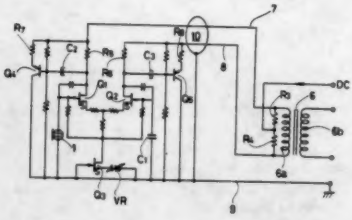


9. A pseudo-full duplex telephone system having a microphone and a loudspeaker, said telephone system comprising:
differential coupling means for connection to a two-wire telephone line;
line balance means connecting said microphone to said differential coupling means for providing an audio signal received by said microphone to said telephone line and connecting said differential coupling means to said loudspeaker for providing a received telephone signal to said loudspeaker;
variable impedance means connected to said line balance means for varying the impedance thereof in accordance with the impedance of said telephone line; and
signal processing means coupled to said variable impedance means and to said line balance means and responsive to an output signal provided by said line balance means to said loudspeaker during the transmission of an audio signal from said microphone to said telephone line for selectively coupling in circuit said variable impedance means to said line balance means in matching the impedance of said telephone system with that of said telephone line.

4,414,433
MICROPHONE OUTPUT TRANSMISSION CIRCUIT

Masao Horie, Tachikawa; Yusuke Sunada, Sumiyoshi, and Junta Inari, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 16, 1981, Ser. No. 274,261
Claims priority, application Japan, Jun. 20, 1980, 55-84271
Int. Cl.³ H01M *1/60*
U.S. Cl. 179—70 **10 Claims**

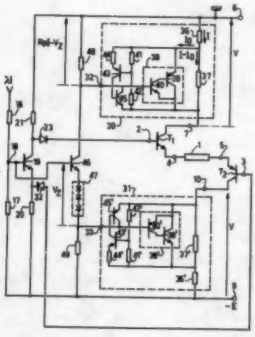


1. In combination with a capacitive microphone providing a microphone output; a microphone output transmission circuit comprising a microphone cable including a pair of transmission lines and a ground line extending between transmission and reception ends of said cable, first coupling means connecting said microphone with said pair of transmission lines, at said transmission end, and being operative to apply said microphone output as a balanced signal to said pair of transmission lines, a source of DC power, received output means, and second coupling means connecting said pair of transmission lines, at said reception end, with said DC power source so as to impose substantially the same DC potential on said pair of transmission lines relative to said ground line, and with said received output means for providing a received output signal at the latter in response to said balanced signal on said transmission lines, at least one of said first and second coupling means including differential amplifier means powered by said DC power source and coupled in a transformerless connection between the respective end of said cable and said microphone or received output means, respectively.

4,414,434
ELECTRONIC SUBSCRIBER LINE INTERFACE CIRCUIT HAVING MEANS TO EQUALIZE CURRENT THROUGH THE OUTPUT DIFFERENTIAL AMPLIFIER

Gilbert M. M. Ferrieu, Bievres; Etienne J. R. Osmond, and Yves J. F. Hetet, both of Lannion, all of France, assignors to Telecommunications Radioelectriques et Telephoniques T.R.T., Paris, France

Filed Mar. 30, 1981, Ser. No. 249,283
Claims priority, application France, Apr. 18, 1980, 80 08770
Int. Cl.³ H04M *19/00*
U.S. Cl. 179—77 **6 Claims**



1. A subscriber's line interface circuit comprising:
a pair of load impedance circuits,
a d.c. voltage supply source,
a pair of amplifiers, a first respective output terminal of each of said pair of amplifiers being connected one amplifier to one wire, the other amplifier to the other wire of two wires of said subscriber's line, a respective supply terminal of each of said pair of amplifiers being connected one amplifier to one load impedance circuit and the other amplifier to the other load impedance circuit of said pair of load impedance circuits,
respective input terminals of said pair of amplifiers receiving by means of negative feedback respective voltages which are in phase and in anti-phase with a voltage at respective control terminals of said pair of impedance circuits through which a sum current flows which is equal to a weighted sum of currents which enter and leave the subscriber's line with substantially equal weighting coefficients and the supply terminals of said pair of amplifiers each being connected to said d.c. voltage supply source by means of said respective load impedance circuits,
said interface circuit further comprises means for forming

two control voltages one for each of said load impedance circuits, a first control voltage which is formed by shifting with a predetermined shift voltage the voltage at the control terminal of one of said impedance circuits to which the sum current flows, the control voltage of the other of said impedance circuits being in anti-phase with the first control voltage,

a corresponding amplifier in each of said impedance circuits, said control voltages being applied to said respective load impedance circuits with the same phase as the voltages applied to the input terminals of said corresponding amplifiers,

said respective load impedance circuits further comprising a voltage follower circuit for producing at said respective supply terminals of said corresponding amplifiers, voltages which are substantially equal to said control voltages.

4,414,435

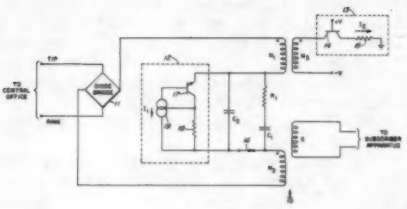
INTERFACE CIRCUIT WITH FLUX CANCELLING TRANSFORMER CIRCUIT

Bryan R. Parlor, Nepean, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Apr. 22, 1982, Ser. No. 370,986

Int. Cl.³ H04M 1/00

U.S. Cl. 179—81 R **8 Claims**



1. A circuit for interfacing a subscriber loop to subscriber terminal apparatus, comprising, a transformer having a split primary winding for connection to said loop, a secondary winding for connection to said apparatus and a balance winding having a polarization opposite to that of the primary winding, a constant current source connected to the balance winding for causing a predetermined amount of current to flow therethrough, a current sink circuit connected serially with the split primary winding for regulating the direct current flowing therethrough to an amount proportional to said predetermined amount of current whereby the DC flux generated thereby substantially cancels the DC flux generated by the current flowing through the balance winding.

8. In a circuit for interfacing a subscriber loop to subscriber apparatus, the interface circuit comprising a transformer having a split primary winding connected to the subscriber loop, a secondary winding connected to the subscriber apparatus and a balance winding, a method of cancelling the effect of the DC flux generated by the direct current flowing through the primary winding, comprising the steps of:

applying a predetermined constant current to the balance winding thereby to generate a predetermined level of DC flux;

current sinking the DC current flowing through the primary winding to an amount proportional to said constant current;

whereby the DC flux generated by the current flowing through the primary winding substantially cancels the DC flux generated by the current flowing through the balance winding.

4,414,436

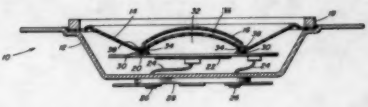
NARROW-FREQUENCY BAND ACOUSTIC TRANSDUCER

Iwao Sashida, Saitmaken, and Tsutomu Haga, Yamagata, both of Japan, assignors to Pioneer Speaker Components, Inc., Arlington Heights, Ill.

Filed Apr. 19, 1982, Ser. No. 369,589

Int. Cl.³ H04R 17/00

U.S. Cl. 179—110 A **16 Claims**



1. An acoustical transducer for conversion of energy between mechanical and electrical stimuli, to provide for the high conversion efficiency of a narrow-frequency band, which transducer comprises in combination:

(a) a conical-shaped, radiating, resonating diaphragm having a truncated area characterized by a depressed central area, to present a thin, circumferential, edge area about the truncated area of the diaphragm;

(b) a convex-shaped cap element extending over the truncated area and having an outer peripheral edge acoustically coupled generally about the circumferential edge area of the diaphragm;

(c) a piezoelectric element having a generally flat major surface and adapted to be driven in a planar mode by electrical energy;

(d) a thin vibration board having a natural resonance frequency within the narrow-frequency band and having a general diameter greater than the diameter of the truncated area of the diaphragm and less than the outer diameter of the diaphragm;

(e) adhesive means to secure the circumferential edge area of the diaphragm to the one side of the vibration board and generally centrally positioned thereof;

(f) means to secure the piezoelectric element to the other side of the vibration board and generally centrally of the vibration board and of the diaphragm; and

(g) electrical communication means to the piezoelectric element,

whereby, on the electrical energizing of the piezoelectric element, the vibration board, acoustically coupled to the circumferential edge area of the diaphragm, and the diaphragm, circumferentially coupled to the cap element, provide for the high decibel output of a narrow-frequency band about the natural resonance frequency of the vibration board.

4,414,437

MOVING COIL DYNAMIC TRANSDUCER

Herbert Trauernicht, Wennigsen, and Karl-Heinz Thiele, Peine-Stederdorf, both of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 2, 1980, Ser. No. 212,280

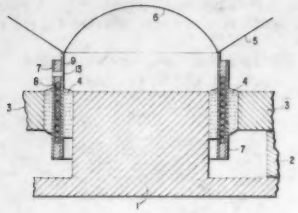
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1979, 2949115

Int. Cl.³ H04R 9/04

U.S. Cl. 179—115.5 VC **7 Claims**

1. In an electromagnetic transducer including means producing a magnetic field and presenting an air gap traversed by the field, a mass of magnetic liquid extending across the air gap, and a moving coil mounted on a moving coil carrier supported for movement through the air gap, the improvement wherein said carrier is provided with at least one passage located to

communicate with the magnetic liquid during at least part of the movement of said coil carrier through the air gap for



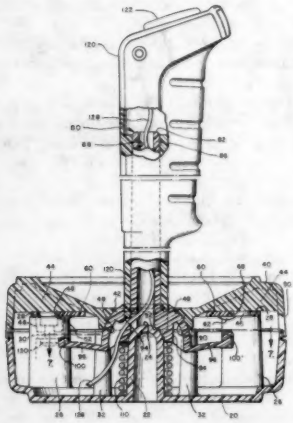
permitting flow of magnetic liquid from one side to the other of said carrier in the direction of said air gap.

4,414,438

VIDEO GAME CONTROLLER

Bruce Maier, Columbia, Mo., and Brian J. Maloney, St. Charles, Ill., assignors to International Jensen Incorporated, Schiller Park, Ill.

Filed Jun. 4, 1982, Ser. No. 384,923
Int. Cl.³ H01H *25/04*
U.S. Cl. 200—6 A **13 Claims**



1. A video game controller comprising:

a joystick handle defining a longitudinal axis and having a lower end portion which defines first and second concentric bearing surfaces spaced along the longitudinal axis;

a housing sized to receive and support the lower end portion of the joystick handle, said housing defining third and fourth concentric bearing surfaces positioned to mate with and support the first and second bearing surfaces, respectively, with the second bearing surface nested within the first bearing surface such that the first and second bearing surfaces are captured between the third and fourth bearing surfaces to provide a smooth pivotal motion to the handle for a range of positive and negative axial forces on the handle, yet the joystick handle is free to pivot about the center of the first and second bearing surfaces;

spring means for biasing the joystick handle to a central position; and

switch means for sensing the pivotal position of the joystick handle;

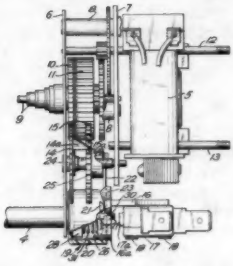
said first and fourth bearing surfaces being convex, said second and third bearing surfaces being concave, the radii of curvature of the first and third bearing surfaces being substantially equal, the radii of curvature of the second and fourth bearing surface being substantially equal, and the radius of curvature of the second bearing surface being less than that of the first.

4,414,439

TIMED SWITCH

Edward V. Pomponio, Milford, Mass., assignor to Timex Corporation, Waterbury, Conn.

Filed Apr. 30, 1982, Ser. No. 373,363
Int. Cl.³ H01H *7/08*
U.S. Cl. 200—38 R **6 Claims**



1. In a timed switch of the type having a motor, a timing gear driven by said motor, a manually rotatable setting gear coaxially disposed and axially movable with respect to said timing gear and having means for axially shifting said gears with respect to one another at a time selectable by rotating the setting gear, the improvement comprising:

a. a switch block disposed near said gears having guide means thereon,

b. an electric switch held by said switch block and having a depressible button to open or close the switch,

c. an actuator longitudinally movable in said guide means and having a plunger adapted to depress said switch button,

d. means biasing the actuator away from the switch,

e. a rotatable selector having a manual latching arm and an automatic latching arm, said selector having cam means cooperating with the actuator to move the actuator longitudinally toward the switch upon rotation of the selector either in a first rotational direction or in an opposite rotational direction, and

f. detent means cooperating with the manual and automatic latching arms to latch the selector after it has turned in either of said rotational directions and to release the automatic latching arm when said gears are shifted axially with respect to one another.

4,414,440

WATERPROOF ELECTRICAL SWITCH WITH SAFETY INTERLOCK

Stephen H. DeCoste, Chatham, N.J., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Jul. 6, 1981, Ser. No. 280,542
Int. Cl.³ H01H *9/20*
U.S. Cl. 200—50 B **6 Claims**

1. An electrical switch comprising:

a housing;

a circuit breaker mounted in the interior of the housing, the circuit breaker being adapted to be connected to a source of electrical power;

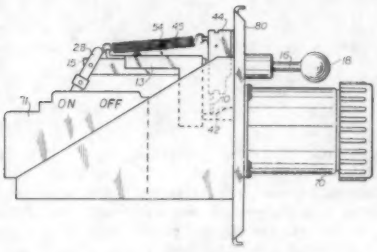
a plug receiving means for receiving an electrical plug, the plug receiving means having at least one electrical con-

nection means for providing an electrical connection between the circuit breaker and the electrical plug;

a circuit breaker actuator means extending from the housing exterior to the housing interior for changing the circuit breaker between ON and OFF states, the circuit breaker actuator means including an actuator rod slidably extending through a first passage means;

a second passage means for defining a passage from the plug receiving means into the interior of the housing;

a locking pin slidably mounted in the second passage means, the locking pin having a cam surface adjacent a first end and having a second end which is adapted to abut a received plug to be slidably moved in the passage means in response to receipt of an electrical plug from a first locking pin position to a second locking pin position;



a locking plate mounted for sliding movement transverse to the sliding movement of the locking pin, the locking plate being disposed in operative connection with the cam surface to be cammed in sliding movement thereby, the locking late being disposed in a first locking plate position when the locking pin is in the first locking pin position and being slidably cammed to a second locking plate position by movement of the locking pin to the second locking pin position; and,

said first passage means being disposed adjacent the locking plate with the actuator rod and the locking plate interacting when the locking plate is in the first locking plate position for locking the actuator rod against sliding movement, whereby changing the state of the circuit breaker is prevented, changing of the circuit breaker state being permitted when the locking plate is in the second position allowing sliding movement of the actuator rod.

4,414,441

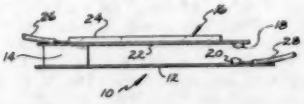
HYDROCARBON RESPONSIVE SWITCH

Ralph A. Perry, Indianapolis, and Raymond J. Andrejasich, Carmel, both of Ind., assignors to Emhart Industries, Inc., Indianapolis, Ind.

Filed Apr. 2, 1982, Ser. No. 364,641

Int. Cl.³ H01H *35/34*

U.S. Cl. 200—61.04 **4 Claims**



1. A hydrocarbon responsive switch, comprising:

an elongated flexible member which is impervious to hydrocarbon substances;

means including ethylene propylene, bonded to said elongated flexible member for absorbing hydrocarbon substances and not absorbing water in contact therewith and for swelling from said absorbing of hydrocarbon substances for causing said contact member to bend;

means for mounting one end of said elongated member;

first electrical contact means located at the other end of said elongated member; and

second electrical contact means for contacting said first contact means upon bending of said elongated flexible member and thereby making electrical connection in response to the absorption of hydrocarbon substances by said means for absorbing.

4,414,442

STEERING COLUMN SWITCH

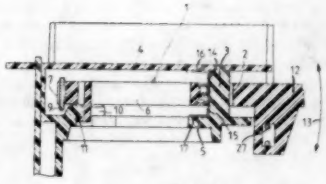
Werner-Ernst Berginski, Werdohl-Eveking, and Wilhelm Wessling, Luedenscheid, both of Fed. Rep. of Germany, assignors to Leopold Kostal GmbH & Co. KG, Luedenscheid, Fed. Rep. of Germany

Filed Apr. 5, 1982, Ser. No. 365,238

Claims priority, application Fed. Rep. of Germany, May 8, 1981, 3118214

Int. Cl.³ H01H *3/16*

U.S. Cl. 200—61.27 **5 Claims**



1. In a steering column switch to be mounted adjacent a steering spindle, a fixed rotary pin with a vertical axis parallel to the steering spindle and mounted between and in contact with two socket plates, a switching lever with an annular ring slider, the annular ring slider having opposite faces and having a passage which has its axis parallel to the pin vertical axis, the passage encompassing the fixed rotary pin and being rotatable about the rotary pin, the annular ring slider being mounted for pivoting such that the ring slider can tilt around a tilting axis that intersects the fixed rotary pin axis while the annular ring slider is rotatably shifted on the fixed rotary pin, the annular ring slider having a stopping profile diametrically opposite the passage for the fixed rotary pin and on the opposite side of the steering spindle, a stop spring engaging the stopping profile, the improvement comprising:

a recess area within the passage;

an electrical contact bridge within the recess area and abutting against the fixed rotary pin;

at least two electrical contact plates mounted on the fixed rotary pin, the respective ones of the contact plates being positioned to be slidably engaged by the electrical contact bridge as the ring slider is tilted around the tilting axis and while the ring slider is rotatably shifted on the fixed rotary pin; and

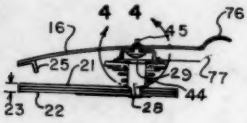
means for forcibly urging the contact bridge in abutting relationship with the fixed rotary pin, whereby the contact bridge slidably engages and establishes electrical contact with the respective ones of the contact plates as the ring slider is tilted around the tilting axis.

4,414,443

ENVIRONMENTALLY PROTECTED SWITCH CONSTRUCTION

Louis M. Gehrt, Jefferson County, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Oct. 28, 1981, Ser. No. 315,738
Int. Cl.³ H01H *19/63*
U.S. Cl. 200—80 R **11 Claims**



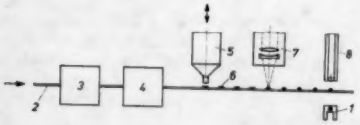
11. In a switch assembly for a dynamoelectric machine, said dynamoelectric machine having at least one winding operable by the action of a centrifugal actuator, said switch assembly being mechanically operated by said centrifugal actuator to energize and de-energize said winding, said switch assembly having at least one surface, a first switch contact mounted to said surface, and a switch arm mounted for movement with respect to said first switch contact, the improvement comprising a cap positioned about said first switch contact, said cap having a closed bottom and an opened top, said cap being movable with said switch arm; a first washer mounted inboard of said cap and sized to close said opened top, a second compressible washer seal mounted inboard of said first washer; a third non-compressible washer mounted inboard of said second washer; and a spring biased between said third washer and the surface of said switch assembly, said first, said second and said third washers being reciprocally movable on said first switch contact, in response to force applied to said switch arm and said spring, whereby movement of said switch arm makes and breaks electrical contact between said dynamoelectric machine and a source of electrical energy.

4,414,444

PROCESS FOR PRODUCING A CONTACT ELEMENT

Friedrich Schneider, Pforzheim, Fed. Rep. of Germany, assignor to G. Rau GmbH & Co., Pforzheim, Fed. Rep. of Germany

Filed Feb. 13, 1981, Ser. No. 234,546
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1980, 3005662
Int. Cl.³ B23K *27/00*
U.S. Cl. 219—121 LM **11 Claims**



1. A process for producing a contact element, said process comprising:

providing a carrier of a non-noble metal material;

positioning on said carrier a layer of a material including at least one of a noble metal and a noble metal alloy;

directing to said layer in a punctiform manner high energy light radiation and thereby completely melting said material of said layer, causing the thus melted layer material to self form into a shape suitable for a contact, and fusing said layer to said carrier over the entire area of mutual contact therebetween; and

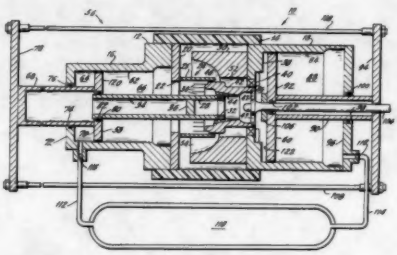
stamping from said carrier a contact element formed of said fused layer and carrier material.

4,414,445

LIQUID SF_6 INTERRUPTER WITH PROPORTIONAL FEEDBACK

Ruben D. Garzon, Malvern, Pa., assignor to Brown Boveri Electric, Inc., Rolling Meadows, Ill.

Filed Aug. 12, 1981, Ser. No. 292,251
Int. Cl.³ H01H *33/88*
U.S. Cl. 200—148 A **14 Claims**



1. A circuit interrupter, comprising;

a housing containing a dielectric material in the liquid phase;

stationary contact means disposed in said housing;

movable contact means disposed in said housing and movable between an engaged position in which it is in electrical contact with said stationary contact means and a disengaged position in which it is mechanically remote from and electrically isolated from said stationary contact means; and

a piston assembly movable between a first position and a second position, said piston assembly being for increasing pressure in a first region of said housing and for simultaneously decreasing pressure in a second region of said housing while moving from said first to said second position, thereby to create a pressure differential between said first and second regions, for causing said dielectric material to flow from said first to said second region as said piston assembly moves from said first to said second position; said piston assembly being adapted to be accelerated in a direction from said first toward said second position by energy generated by an arc between said stationary and said movable contact means; and said piston assembly being subject to a force exerted on it by said dielectric material urging said piston assembly in a direction from said second toward said first position, when the pressure of said dielectric material is substantially uniform throughout said housing; said piston assembly being movable independently of the movement of said movable contact means.

4,414,446

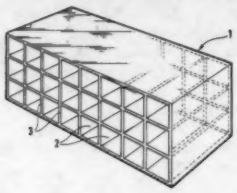
ELECTRIC ARC COOLING APPARATUS FOR THE CHIMNEYS OF CUT-OUT DEVICES

Jean-Philippe Gelez, Saint Mande, France, assignor to Societe Anonyme dite Alsthom-Atlantique, Paris, France

Filed Oct. 30, 1980, Ser. No. 202,217
Claims priority, application France, Oct. 31, 1979, 79 27013
Int. Cl.³ H01H *33/08*
U.S. Cl. 200—144 R **1 Claim**

1. An electric arc cooling apparatus for chimneys of cut-out devices, said apparatus including at least one unit made of a refractory ceramic material including intersecting partitions forming in cross-section for said unit, cells passing through it, and wherein the thickness of the partitions defining said cells is less than or equal to one fifth of the width of said cells;

whereby, the arc plasma flows through the cells without great loss of head and without sustaining damage, even though said



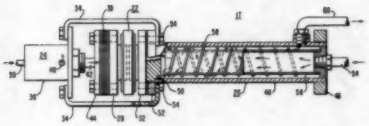
arc may be at several thousand degrees, and said unit functions to absorb most of the heat energy of said arc.

4,414,447

LOW DC VOLTAGE, HIGH CURRENT SWITCH ASSEMBLY

Robert M. Hruda, Horseheads, N.Y., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 27, 1981, Ser. No. 267,827
Int. Cl.³ H01H *33/66*
U.S. Cl. 200—144 B **16 Claims**



1. A low voltage, high current DC switch assembly and integral operating means and resistive element for use as a shunt switch assembly connectable between generally parallel spaced apart electrical terminals or conductors, comprising:

(a) a low voltage DC switch including a pair of relative reciprocally movable contacts disposed within a hermetically sealed envelope portion, with a first switch contact flexibly connectable to a first electrical terminal, and a second switch contact rigidly connectable to a resistive element;

(b) switch operating means having a body portion rigidly connected to the second switch contact, and reciprocally movable drive member connected to the first switch contact to effectuate switch contact opening and closing;

(c) a generally tubular resistive element having first connection means at one end for connection to the second switch contact, and second connection means at the other end for connection to the second electrical terminal, and means for passing cooling fluid through the tubular resistive element.

4,414,448

VACUUM CIRCUIT INTERRUPTER

Yutaka Kashimoto, Tokyo; Shinzo Sakuma, Kawasaki; Junichi Warabi, Shizuoka; Yukio Kobari, and Hidemi Kawaguchi, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Jul. 6, 1981, Ser. No. 280,467
Claims priority, application Japan, Jul. 7, 1980, 55-92561
Int. Cl.³ H01U *33/66*
U.S. Cl. 200—144 B **4 Claims**

1. A vacuum circuit interrupter comprising:

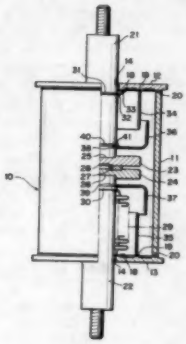
(a) a plastically deformable metallic cylinder (**11**);

(b) first and second insulating disks (**12, 13**) closing the opposite ends of the metallic cylinder to form therewith an evacuated envelope (**10**), the first and second disks each having a coaxial center aperture (**14**);

(c) a stationary conductive rod (**21**) coaxially entering the envelope through the center aperture of the first disk, the stationary rod being fixed to the first disk in such a manner as to provide a seal thereabout;

(d) a movable conductive rod (**22**) coaxially and movably entering the envelope through the center aperture of the second disk in such a manner as to align with the stationary rod;

(e) a bellows (**29**) surrounding the movable rod inside the envelope, the bellows being fixed at its one end to the movable rod and at its other end to the second disk in such a manner as to provide a seal about the movable rod to allow for movement thereof without impairing the vacuum inside the envelope;



(f) stationary and movable electrodes (**23, 24**) connected to the stationary and movable rods respectively in such a manner as to engage with each other when the movable rod moves toward the stationary rod and disengage when the movable rod moves away from the stationary rod;

(g) a first conductive shield (**34**) surrounding the stationary rod inside the envelope, the first shield being fixed to the first disk in such a manner as to be isolated electrically from the stationary rod and the metallic cylinder; and

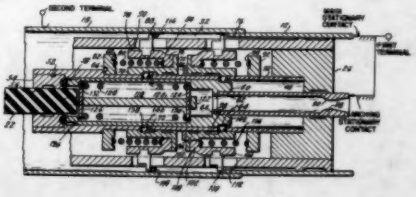
(h) a second conductive shield (**35**) surrounding the bellows inside the envelope, the second shield being fixed to the second disk in such a manner as to be isolated electrically from the movable rod and the metallic cylinder.

4,414,449

QUICK OPEN AND CLOSE DISCONNECT SWITCH

Ruben D. Garzon, Malvern, Pa., assignor to Brown Boveri Electric Inc., Rolling Meadows, Ill.

Filed May 26, 1981, Ser. No. 267,372
Int. Cl.³ H01H *9/38*
U.S. Cl. 200—146 R **19 Claims**



1. A disconnect switch, comprising:

stationary contact means;

first terminal means electrically connected to said stationary contact means;

a first moving contact;
a second moving contact;
second terminal means electrically connected to said first and second moving contacts;
means for moving said first moving contact at a first speed between a first position in which it is in electrical and mechanical contact with said stationary contact means and a second position in which it is spaced from and out of electrical contact with said stationary contact means, and for moving said second moving contact at a second speed greater than said first speed between a third position in which it is in electrical and mechanical contact with said stationary contact means and a fourth position in which it is spaced from and out of electrical contact with said stationary contact means;
latching means for retaining said second moving contact in said third position while said first moving contact moves from said first position towards said second position, until said first moving contact has moved a first predetermined distance towards said second position for retaining said second moving contact in said fourth position when said first moving contact moves from said second to said first position, until said first moving contact has moved a second predetermined distance toward said first position, and
latch defeating means for defeating said latching means to release said second moving contact once said first moving contact has moved said first predetermined distance; said latch defeating means further defeating said latching means to release said second moving contact once said first moving contact has moved said second predetermined distance.

4,414,450

HIGH VOLTAGE POWER SWITCH

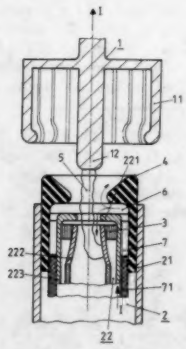
Rudolf Moll, Zollikon; Klaus Ragaller, Neuenhof, and Ekkehard Schade, Wettingen, all of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed May 4, 1981, Ser. No. 260,203

Claims priority, application Switzerland, May 7, 1980, 3545/80

Int. Cl.³ H01H *33/70, 33/82*

U.S. Cl. 200—147 R **4 Claims**



1. A high voltage power switch for interrupting alternating current flow, comprising:
an axially displaceable commutating contact;
a stationary hollow commutating contact having a first part that is configured as a nozzle and a second part disposed within said first part;
a nozzle that defines a gas flow path in conjunction with said first part to direct a flow of compressed gas into an expansion chamber of the switch;
a cylindrical electromagnetic coil disposed between said first and second parts of said stationary contact and electrically connected between said first and second parts to generate a magnetic field that is parallel to the axis of an arc formed between said contacts; and
a compression device for producing a flow of compressed gas along said flow path defined by said nozzle, upon actuation of said contacts, having a magnitude sufficient to commutate an electrical arc between said contacts from said first to said second part of said stationary contact within a period of time that is shorter than the length of the half-wave of the current being interrupted and prior to the time that the current changes polarity to thereby energize said coil and magnetically extinguish the arc.

4,414,451

DISCONNECT SWITCH

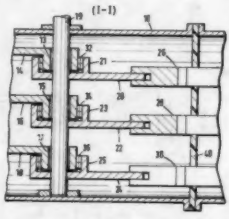
Rolf Bleidt, and Heinrich Neumaier, both of Hanau, Fed. Rep. of Germany, assignors to Brown, Boveri & Cie AG, Mannheim, Fed. Rep. of Germany

Filed Jul. 23, 1980, Ser. No. 171,344

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1979, 2930075

Int. Cl.³ H01H *33/64*

U.S. Cl. 200—148 H **3 Claims**



1. Disconnect switch, comprising a metal housing, SF_6 insulating gas filling said housing, a three-phase bus bar disposed outside said housing, three phase-feed conductors each being connected to a respective one of said phases of said bus bar and each having a fixed bus bar contact leading into said housing, a safety switch disposed outside said housing, three outgoing conductors each being connected to said safety switch and leading into said housing, an insulated drive shaft leading into said housing, three contact blades disposed in said housing and each being rotatable on said drive shaft into current-conducting connection with a respective one of said fixed bus bar contacts in an on position, three first bearing bushings each being integral with a respective one of said contact blades, three second bearing bushings each being integral with a respective one of said outgoing conductors in said housing, and three multi-contact bushings each being supported coaxially on said drive shaft in said housing and each forming a continuous current-conducting connection between a respective first and second bearing bushing.

4,414,452

MEANS FOR ATTACHING AUXILIARY DEVICES TO A MEMBRANE SWITCH

Ronald S. Denley, Woodstock, Ill., assignor to Oak Industries Inc., Rancho Bernardo, Calif.

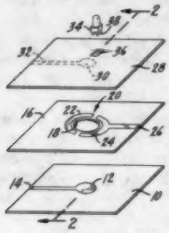
Filed Dec. 13, 1982, Ser. No. 448,929

Int. Cl.³ H01H *13/12, 9/02*

U.S. Cl. 200—159 B **6 Claims**

1. In a membrane switch of the type having a substrate, a first switch contact on the top surface of the substrate, a flexible membrane, a second switch contact on the bottom surface of the membrane and aligned with the first switch contact, a spacer between the substrate and membrane having an aperture in register with the switch contacts such that the contacts are normally in spaced, facing relation while pressure on the

membrane top surface moves the second contact through the aperture and into engagement with the first contact thereby closing the switch, the improvement comprising means for incorporating a discrete electrical component into the membrane switch including a current supply circuit formed on the top surface of the spacer, an opening in the membrane providing access to the current supply circuit, and means for retaining the discrete component in the opening and in electrical contact with the current supply circuit.



4,414,453

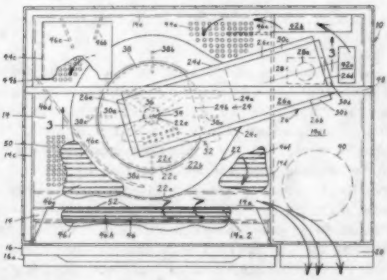
MICROWAVE OVEN FEED APPARATUS

James E. Simpson, Coralville, Iowa, assignor to Raytheon Company, Lexington, Mass.

Division of Ser. No. 971,727, Dec. 21, 1978, Pat. No. 4,284,868. This application Nov. 24, 1980, Ser. No. 209,847

Int. Cl.³ H05B *6/72*

U.S. Cl. 219—10.55 F **7 Claims**



1. Directional rotating antenna for use in a microwave heating cavity comprising:

a. a probe antenna extending through an aperture in a surface of said cavity for receiving microwave energy in a waveguide and coupling it into said cavity, said probe antenna being substantially perpendicular to said surface;

b. a transmission line conductor connected to said probe antenna within said cavity, said transmission line conductor being adjacent and substantially parallel to said surface;

c. first and second conductor legs respectively connected to the ends of said transmission line conductor, said legs extending inwardly to said cavity away from said surface;

d. first and second antennas respectively connected to the inwardly extending ends of said first and second conductor legs, said first and second antennas being substantially parallel to said surface; and

e. means to axially rotate said probe antenna whereby said first and second antennas radiate microwave energy in said cavity with uniform energy distribution.

4,414,454

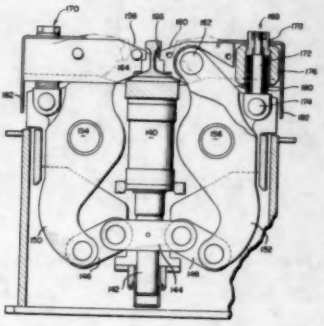
METHOD OF WELDING CONTINUOUS RAILS AND APPARATUS THEREFOR

Hans R. Zollinger, Geroldswil, Switzerland, assignor to H. A. Schlatter AG, Schlieren, Switzerland

Filed Aug. 13, 1981, Ser. No. 292,597

Int. Cl.³ B23K *11/02;* **E01B** *29/17*

U.S. Cl. 219—53 **12 Claims**



12. Welding apparatus for welding workpiece sections together in end-to-end relationship to form a continuous length comprising a main frame, a fixed assembly supported by said main frame, a movable assembly supported by said main frame and longitudinally movable with respect to said fixed assembly, first and second electrodes respectively engageable with adjacent end portions of successive workpiece sections to be welded together and means for causing current flow between the electrodes and through the ends of the workpiece sections in order to make the weld, said fixed and movable assemblies each comprising a pair of clamp assemblies for clamping the ends of said workpiece sections to be welded together, said clamp assemblies each comprising a hydraulic cylinder, a pair of clamp arms pivotally supported in opposed relationship so as to clamp the workpiece section between them and a plurality of lever arms coupled to said hydraulic cylinder and the respective ones of said pair of clamp arms for pivotally operating said clamp arms to clamp the workpiece section between them upon operation of said hydraulic cylinder, a spring assembly associated with each of said clamp arms for transmitting to said clamp arms a vertical press-on force for clamping the workpiece section, said clamp assemblies being pivotally operable to clamp a workpiece section between them and to open to permit the workpiece section and the welding apparatus to be vertically displaced with respect to one another, each of said pair of clamp arms having removably affixed to the end thereof a clamp head formed to substantially correspond to the shape of said workpiece sections to be welded together, whereby said welding apparatus can be utilized to weld together in end-to-end relationship various workpieces such as pipes to form a continuous length pipeline, said electrodes likewise being correspondingly formed to the shape of the workpiece.

4,414,455

METHOD OF AND APPARATUS FOR PRODUCING CAN BODIES WELDED ALONG THE LONGITUDINAL SEAM

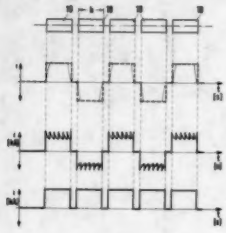
Franz Schneider; Walter Panknin, both of Göppingen, Fed. Rep. of Germany; Zelimir Belamaric, Marin, and Fred Schalch, Le Landeron, both of Switzerland, assignors to L. Schuler GmbH, Goeppingen, Fed. Rep. of Germany

Filed Feb. 12, 1981, Ser. No. 233,866

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1980, 3005083

Int. Cl.³ B23K *11/06*

U.S. Cl. 219—64 15 Claims



1. A method of making can bodies welded along a longitudinal seam on a resistance welding apparatus which includes a source of electric energy operable to produce nearly rectangular pulses of welding current and a pair of opposed welding electrodes operatively connected with said source so that overlapping portions of the can bodies are continuously welded as they are passed through said pair of electrodes, comprising the steps of controlling the duration of a half wave of a nearly rectangular welding current pulse in such a manner that it is matched to the time required for a given can body to pass between said welding electrodes, and reversing the polarity of the nearly rectangular welding current pulses from one can body to the next can body.

4,414,456

ELECTROEROSIVE WIRE-CUTTING METHOD AND APPARATUS WITH A SHAPED HIGH-VELOCITY STREAM OF A CUTTING LIQUID MEDIUM

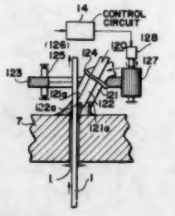
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Mar. 19, 1981, Ser. No. 245,597

Claims priority, application Japan, May 1, 1980, 55-58915

Int. Cl.³ B23P *1/02*

U.S. Cl. 219—69 W 31 Claims



1. In a method of electroerosively cutting an electrically conductive workpiece with a continuous wire electrode, wherein the wire electrode is axially transported to traverse the workpiece to define a cutting gap therewith flushed with a cutting liquid medium and is electrically energized to electroerosively remove material from the workpiece while the latter is displaced relative to the wire electrode transversely to the axis thereof, thereby forming a cutting slot behind the advancing wire electrode in the workpiece, the improvement which comprises flushing said cutting gap with said cutting liquid medium by:

(a) directing at a region of said cutting gap a high-velocity columnar stream of the cutting liquid medium having a width substantially equal to the width of said cutting slot at least in the direction of the latter width; and

(b) directing towards the region of said cutting gap in generally the same direction as the high-velocity columnar stream, a low-velocity stream of the cutting liquid medium so as to surround said high-velocity columnar stream and thereby to form a protective curtain about said high-velocity columnar stream and a pressure cushion to force the latter substantially in its entirety to pass into said cutting slot and said cutting gap without breakup or divergence.

4,414,457

WIRE-CUT, ELECTRIC DISCHARGE MACHINE

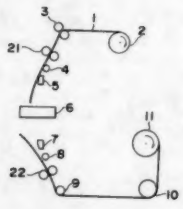
Yoshiyuki Nomura, and Kanemasa Okuda, both of Hino, Japan, assignors to Fujitsu Fanuc Ltd., Tokyo, Japan

Filed Jun. 2, 1981, Ser. No. 269,594

Claims priority, application Japan, Jun. 3, 1980, 55-77229

Int. Cl.³ B23P *1/12, 1/08*

U.S. Cl. 219—69 W 6 Claims



1. A wire-cut electric discharge machine for machining of a workpiece into a desired shape by producing a discharge between the workpiece and a wire installed on its running system, including in sequence a supply reel, a first fixed running system guide, the workpiece, and a take-up means for taking up the wire, said take-up means including a driven roller pair and a second fixed running system guide disposed between the workpiece and the driven roller pair, comprising: undriven roller pair means for gripping the wire with constant pressure and for preventing the wire installed in the running system from coming out of the running system, said undriven roller pair means being provided between the first fixed running guide and the supply reel, the undriven roller pair means including a fixed roller, a pressure roller and a spring, said pressure roller being urged against the fixed roller by means of the spring.

4,414,458

WIRE-CUT, ELECTRIC DISCHARGE MACHINE

Yoshiyuka Nomura, Hino, Japan, assignor to Fijitsu Fanuc Limited, Tokyo, Japan

Filed Apr. 1, 1981, Ser. No. 249,834

Claims priority, application Japan, Apr. 14, 1980, 55-48969

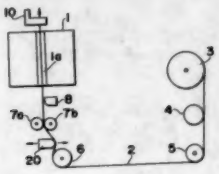
Int. Cl.³ B23P *1/08*

U.S. Cl. 219—69 W 13 Claims

3. An improved electric discharge machine of the type provided with a means for automatically installing an elongated electrode by gripping the elongated electrode with feed-up rollers after the elongated electrode has been released from a supply reel and by guiding the elongated electrode into a machining starting hole in the workpiece, wherein the improvement comprises:

straightening guide means positioned directly in front of the

feed-up rollers and between the feed-up rollers and the supply reel for straightening the elongated electrode out,



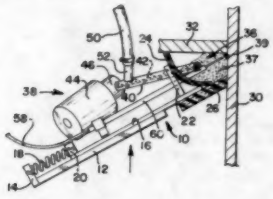
said straightening guide means having a curved surface which guides the elongated electrode thereacross.

4,414,459

METHOD AND APPARATUS FOR OVERHEAD WELDING

James E. Sims, Houston, Tex., and Robert C. Schmick, Elmhurst, Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Nov. 2, 1981, Ser. No. 317,139
Int. Cl.³ B23K *9/18*
U.S. Cl. 219—73.2 **9 Claims**



1. A method of overhead welding which comprises:
positioning first and second metal plates with respect to each other so that they can be joined together by overhead welding of a joint;
placing an electrically insulated support means for granular flux so as to span the joint with flux in a section of the joint to be welded;
forcing granular welding flux onto the flux support means to cover the joint section with flux; and
traversing the joint section with a welding arc submerged in the flux on the flux support means thereby depositing a weld which joins the plates together at the joint.

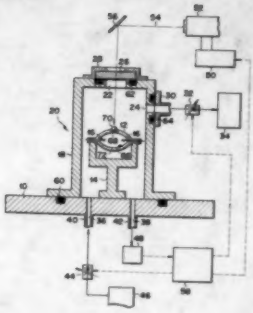
4. Apparatus for overhead welding a first metal plate to a second metal plate comprising:
a base;
an electrically insulated support means for granular flux, adapted to span and cover with flux an overhead joint to be welded, on the base;
a welding wire guide for directing the wire to an overhead joint covered by the flux support means; and
flux feeder means at least partially supported by the base for forcing granular welding flux onto the flux support means to cover the joint with flux.

4,414,460

METHOD OF SEALING A TUBE USING A LASER BEAM

Shigeru Sudo, Tokyo, and Masaaki Yada, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 10, 1981, Ser. No. 329,436
Claims priority, application Japan, Dec. 26, 1980, 55-185829
Int. Cl.³ B23K *27/00*
U.S. Cl. 219—121 LD **6 Claims**



1. In a method of sealing a tube, comprising the steps of placing a tube having an aperture to be hermetically sealed inside a vessel having a window which transmits a laser beam, filling the vessel with a gas or gases of predetermined kinds at a predetermined filling gas pressure and irradiating said tube near said aperture with the laser beam for sealing said aperture, the improvement which comprises the steps of:
covering said aperture with a blockage member; and
irradiating said blockade member with the laser beam, while forming a gas stream within the vessel with said gas pressure maintained, to melt said blockade member and to seal said aperture.

4,414,461

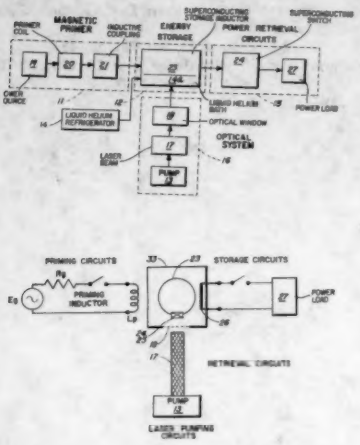
LASER PUMPED SUPERCONDUCTIVE ENERGY STORAGE SYSTEM

Alfred A. Wolf, Annapolis, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 21, 1981, Ser. No. 294,873
Int. Cl.³ H02J *15/00*; H01F *36/00*; H01B *7/34*
U.S. Cl. 219—121 L **2 Claims**

1. A superconductive energy storage system comprising:
a superconducting coil means for carrying large currents in a closed loop;
refrigerating means for cooling said coil means to superconducting temperatures, including a dewar containing a liquid helium bath for receiving said coil means and a liquid helium refrigerator for replenishing liquid helium in said bath;
primer means for inductively starting a circulating current in said coil means;
a laser means for transmitting additional energy into said coil means;
an optical window in said dewar through which light from said laser passes;
an optical absorber mounted on said coil means for receiving light energy from said laser means to increase the current in said coil; and
retrieval means for retrieving energy from said coil means;
whereby said laser means is operated at a frequency below

the critical frequency of said superconducting coil so that when said laser means shines on said optical absorber, the



energy of said storage system and said current in said coil increase without causing normalization of the system.

4,414,462

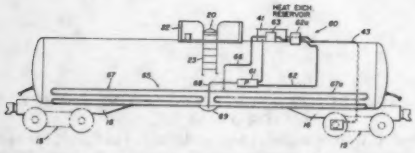
TANK CAR HEATING SYSTEM

Albert E. Price, Bolingbrook, Ill., assignor to General American Transportation Corporation, Chicago, Ill.

Filed Jul. 17, 1981, Ser. No. 284,460

Int. Cl.[3] **B60L** *1/02;* **H05B** *3/00;* **B61D** *5/00;* **F28D** *1/06*

U.S. Cl. 219—202 **9 Claims**



1. A heating system for the tank structure of a railway tank car adapted to contain a liquid lading that is to be maintained in a heated condition, said heating system comprising electrically-powered pump means carried by the tank car, said pump means having a fluid inlet and a fluid outlet and adapted to be coupled to an associated source of electric power, heating conduit means interconnecting the fluid inlet and the fluid outlet of said pump means for cooperation therewith to form a closed loop, said conduit means including a reservoir portion and an elongated sinuous heating portion disposed along the outside of the bottom of the associated tank structure and arranged to be in good heat exchange relationship with the lading contained therein, a heating fluid confined in said closed loop for recirculation therethrough by said pump means, a heat source consisting solely of a resistance-type electric heater disposed in said reservoir portion of said conduit means in heat exchange relationship with said heating fluid and adapted to be coupled to the associated source of electric power for heating said heating fluid as it flows through said conduit means, and thermostatic control means coupled to said pump means and to said heat source for automatic deactuation of both said pump means and said heat source in response to elevation of the temperature of the liquid lading above a predetermined temperature.

4,414,463

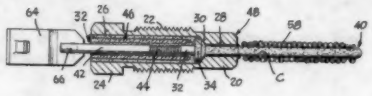
DIESEL GLOW-PLUG IGNITOR

John T. Petrik, Newtown, and Brooke N. Westover, Stratford, both of Conn., assignors to Sun Chemical Corporation, New York, N.Y.

Filed Sep. 17, 1981, Ser. No. 303,004

Int. Cl.[3] **F23Q** *7/10*

U.S. Cl. 219—270 **7 Claims**



1. A diesel glow-plug ignitor comprising, in combination:

(a) a tubular metal body having an inner end securely carried in a cylinder opening of an engine,

(b) an electrically conductive core pin insulatedly carried in the bore of the body, physically structurally united therewith, and having a portion projecting from said inner end thereof, said projecting portion of said core pin being coated with insulating material, and

(c) a tight-wound helical igniting coil of resistance wire on said projecting portion of the core pin, having its ends respectively welded to the body and welded substantially to the end of said projecting portion of the pin,

(d) the convolutions of said coil having an insulating oxide coating thereon to prevent them from short-circuiting each other,

(e) said insulating material on the core pin having ceramic-containing insulation and being plasma sprayed thereon to further prevent the convolutions of the coil from electrically contacting the projecting portion of the core pin.

4,414,464

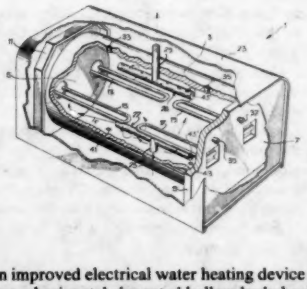
ELECTRICAL WATER HEATING DEVICE WITH IMPROVED INTERNAL CIRCULATION

Louis Cloutier, 486 Principale St., Richmond, Comte de Richmond, Quebec, Canada

Filed Jun. 24, 1981, Ser. No. 276,759

Int. Cl.[3] **F24H** *1/20;* **H05B** *3/82*

U.S. Cl. 219—312 **4 Claims**



1. In an improved electrical water heating device of the type comprising a horizontal elongated hollow body having a top, a bottom, and a pair of opposite ends, at least two heating elements mounted opposite each other at the same horizontal level in the body at both ends thereof, a water inlet centrally located in the bottom of the body and a water outlet having the same diameter as said inlet centrally located in the top of the body, the improvement comprising first and second identical nozzles mounted in said body in a symmetrical manner, said

first nozzle connected to said inlet and said second nozzle connected to said outlet of the device, each of said first and second nozzles comprising a first vertical tubular section having a diameter substantially equal to the diameter of said inlet and outlet of the device, respectively, and a second horizontal tubular section connected to and having substantially the same diameter as the first tubular section, said second tubular section extending perpendicularly to one end of the first tubular section and connected thereto at its midpoint to form together with said first tubular section a hollow T-shaped element;

the other end of said first tubular section of one of the first and second nozzles being connected to the inlet and the other end of the first tubular section of the other nozzle being connected to the outlet, said second section which forms the horizontal bar of the T being closed at both ends and provided with two sets of holes that are symmetrical with respect to a plane passing through the longitudinal axis of the first section perpendicularly to the axis of the second section;

each set of holes in said second tubular section comprising a pair of first circular holes, each having a diameter smaller than the inner diameter of the second section and on an axis parallel to that of the second section, one of said first holes being eccentrically located on each closed end of the second section, said set of holes also comprising identically shaped second holes, each having a diameter equal to that of the first hole and an axis parallel to the longitudinal axis of the first section, said second holes being located close to each other at the vicinity of the closed ends of the second section and opening in the same direction as the first section, each set of holes further comprising three identical third holes each having a diameter smaller than that of the first and second holes, said third holes being located a short distance from each other according to a helicoidal line extending from the first section toward the closed end of the second section, the axis of the second of said third holes extending parallel to the longitudinal axis of the first section and opening in the same direction as the latter.

4,414,465

COOKING APPARATUS

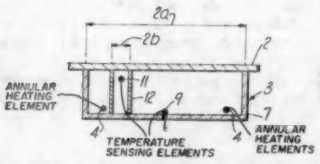
Stephen J. Newton, Haslemere, and Abdul H. Patel, Fareham, both of England, assignors to Thorn Domestic Appliances (Electrical) Ltd., London, England

Filed Mar. 4, 1981, Ser. No. 240,324

Claims priority, application United Kingdom, Mar. 5, 1980, 8007544; Aug. 4, 1980, 8025339

Int. Cl.³ H05B 3/68

U.S. Cl. 219—449 **8 Claims**



1. Cooking apparatus including: a glass ceramic hot plate; at least one heater for heating the hot plate disposed within an open-topped insulated housing below the hot plate; and a temperature responsive element spaced from the hot plate by a gap, and disposed, in use, to receive heat energy across the gap directly from the hot plate, so that the heat energy it receives is primarily radiant energy directly from the hot plate, and to produce a first electrical signal indicative of the temperature sensed thereby; the cooking apparatus also including a further temperature responsive element sensing the temperature of an area of the hot plate shielded from direct heating by the heater and to produce a second electrical signal indicative of the sensed temperature; and control circuitry wherein the first signal is used for maximum temperature cut-out and the second signal is used for closed loop control of the heater.

4,414,466

ELECTRIC HOTPLATE

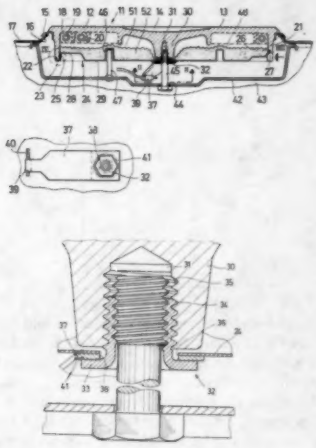
Karl Fischer, Am Gänsberg, D-7519 Oberderdingen, and Felix Schreder, Oberderdingen, both of Fed. Rep. of Germany, assignors to Karl Fischer, Fed. Rep. of Germany

Continuation of Ser. No. 177,873, Aug. 14, 1980, Pat. No. 4,348,581. This application Aug. 25, 1982, Ser. No. 411,426

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1979, 2933296

Int. Cl.³ H05B 3/68

U.S. Cl. 219—459 **9 Claims**



1. An electrical hotplate for use in a cooking applicance having:

a hotplate member with a downwardly projecting pin with an internal thread,

electrical heating resistor means secured to the underside of said hotplate member,

a covering sheet covering the underside of the hotplate member,

screw means to secure both the covering sheet to the hotplate and the hotplate to the cooking appliance, the screw means comprising:

a hollow screw having an internal and an external thread and an outwardly projecting shoulder,

the external thread being screwed into said pin and securing the covering sheet between the shoulder and the pin and

a fastening screw for mounting the cooking hotplate at the cooking appliance, which fastening screw can be screwed into the internal thread.

4,414,467

VENDING ORDERING TERMINAL

George K. Gould, Pound Ridge, and Eric Steinberg, Bronx, both of N.Y., assignors to Video Corporation of America, New York, N.Y.

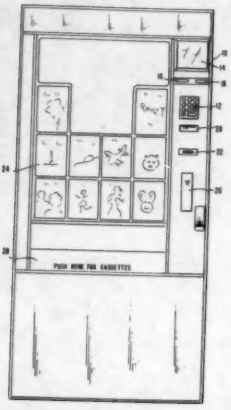
Continuation-in-part of Ser. No. 93,085, Nov. 13, 1979, Pat. No. 4,300,040. This application Jun. 29, 1981, Ser. No. 278,852

Int. Cl.³ G06K 5/00

U.S. Cl. 235—381 **8 Claims**

1. A terminal at which a user can selectively preview or order a videocassette, said terminal comprising, customer identification means for receiving information relative to the

user; mode selection means enabling the user to choose a preview or order mode; cassette selection means for selecting and identifying a desired videocassette; terminal control means including a memory coupled to said customer identification means and said cassette selection means to receive and store information representative of the user, the data, and the selected videocassettes; vending means for storing a plurality of videocassettes and for selectively vending the selected video-



cassette; vending control means coupled to said terminal control means for communicating said information between said memory and said vending means to command the vending of the selected videocassette when the order mode has been selected; and preview display means coupled to said terminal control means for receiving said information and displaying a trailer corresponding to the selected videocassette when the preview mode has been selected.

4,414,468

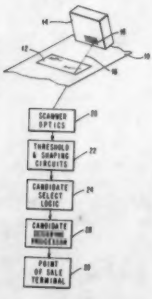
SYSTEMATIC ERROR CORRECTION IN BAR CODE SCANNER

George J. Laurer, Wendell, and Olen L. Stokes, Jr., Cary, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 18, 1981, Ser. No. 264,879

Int. Cl.³ G06K *7/10*

U.S. Cl. 235—462 **7 Claims**



1. For use in a system for reading a bar-coded multicharacter label which may include characters which can be fully decoded only by use of a bar width measurement, an improved method for correcting for systematic errors in apparent bar widths comprising the steps of:

decoding the label characters in succession until a character is encountered which requires a bar width measurement in order to be fully decoded;

correcting the apparent bar width of said character as a function of the measured character width and the measured and standard total bar width of the previously decoded character;

fully decoding said character using the corrected bar width; and

repeating the above-described steps until all characters in the label have been fully decoded.

4,414,469

AUTOMATIC FOCUSING APPARATUS WITH DETECTION ONLY WHEN THE LENS IS STATIONARY

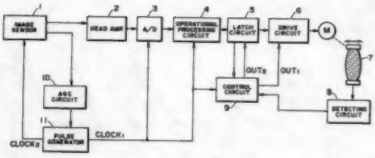
Akira Ogasawara, Yokohama, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Nov. 13, 1981, Ser. No. 321,076

Claims priority, application Japan, Nov. 18, 1980, 55-162339; Aug. 20, 1981, 56-130696

Int. Cl.³ G01S *1/36*

U.S. Cl. 250—201 **9 Claims**



1. An apparatus for focusing a focusing optical system to an object comprising:

(a) photoelectric converter means including a photoelectric cell array having a plurality of photosensor cells each capable of storing charge in accordance with a quantity of incident light, said photoelectric cell array being arranged on an effective focal plane of said optical system, said photoelectric converter means sequentially producing the charges stored in said photoelectric cells;

(b) means for determining a positional relation between said object and said optical system based on said sequential charge outputs to produce a control output to indicate a displacement of said optical system necessary to attain focused condition;

(c) store means for storing said control output;

(d) drive means responsive to said control output stored in said store means for moving said optical system; and

(e) control means for permitting said store means to store only the control output produced based on the sequential outputs produced when said optical system is stationary.

4,414,470

PUPIL DIVISIONAL FOCUSING POSITION DETECTION APPARATUS USING LENTICULA LENS

Hideo Nakaoka, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 1, 1980, Ser. No. 117,818

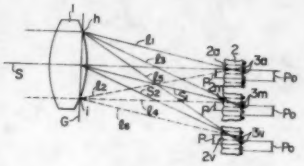
Claims priority, application Japan, Feb. 8, 1979, 54-13655; Feb. 8, 1979, 54-13656

Int. Cl.³ G03B *3/00*; H01J *40/14*

U.S. Cl. 250—204 **12 Claims**

1. In a focusing position detection apparatus for detecting a focusing position by causing rays of light coming from a peripheral portion of an exit pupil of a photographing lens to enter a pair of self-scanning type photoelectric element arrays through a lenticular lens group and then detecting the difference of the phases of the output signals from said photoelectric

element arrays, the improvement in which the pitch Po between photoelectric elements which constitute said pair of photoelectric element arrays is determined so as to maintain a relationship of $Po = P + W P/D$, wherein P is the pitch between small lens elements which constitute said lenticular lens group,



D is the distance between the exit pupil plane of said photographing lens and the center of curvature of a small lens element located on the optical axis of said photographing lens, and W is the distance between the center of curvature of said small lens element on said optical axis and a plane on which said photoelectric element arrays are disposed.

4,414,471

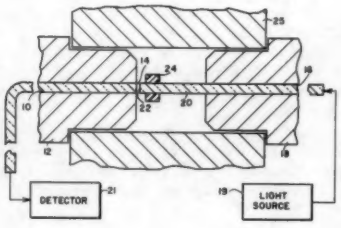
FIBER OPTIC ACOUSTIC SIGNAL TRANSDUCER USING REFLECTOR

Glen A. Rines, Brookline, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Division of Ser. No. 209,441, Nov. 24, 1980, abandoned, which is a continuation-in-part of Ser. No. 138,385, Apr. 8, 1980, abandoned. This application Apr. 26, 1982, Ser. No. 371,398

Int. Cl.³ G02B 5/14

U.S. Cl. 250—227 **11 Claims**



1. Apparatus for sensing acoustic signals, comprising:
an optical fiber;
means for applying light to said optical fiber;
a reflective member displaced from said optical fiber;
means coupled to said optical fiber for detecting light incident on said reflective member from said optical fiber and reflected back to said optical fiber from said reflective member; and
a cantilevered beam responsive to acoustic signals to alter the path of light between said reflective member and said optical fiber.

4,414,472

METHOD FOR DETERMINING THE SOLIDS WEIGHT FRACTION OF A SLURRY

John S. Watt, Heathcote, Australia, assignor to Australian Atomic Energy Commission, New South Wales, Australia

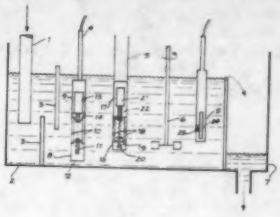
Filed Sep. 17, 1980, Ser. No. 187,884

Claims priority, application Australia, Sep. 27, 1979, PE 0686

Int. Cl.³ G01N 23/00

U.S. Cl. 250—359.1 **14 Claims**

1. A method for determination of the solids weight fraction of a slurry comprising determining the relative concentration of hydrogen by weight in said slurry by neutron scatter or



transmission measurement, and calculating the solids weight fraction from said concentration of hydrogen.

4,414,473

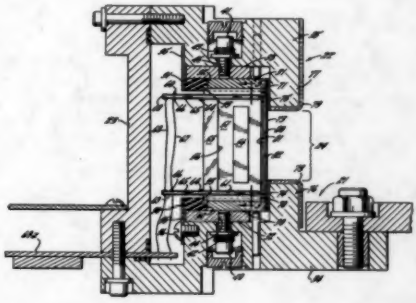
RESILIENT MOUNT FOR MODULAR DETECTOR CELL

David M. Hoffman; Dennis Pritzkow, and George R. Lang, all of New Berlin, Wis., assignors to General Electric Company, Milwaukee, Wis.

Filed Feb. 23, 1981, Ser. No. 236,804

Int. Cl.³ G01T 1/20

U.S. Cl. 250—366 **6 Claims**



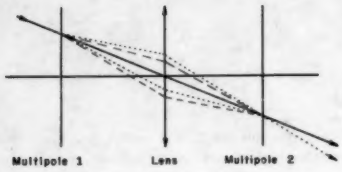
1. In a scintillation detector having a housing including a pair of arcuate opposed end members carrying slots for receiving collimator plates, a plurality of collimator plates for slidingly but snugly fitting into opposed slots to define a plurality of detector cells, and means associated with each plate for detecting radiation received by its cell and producing an electrical signal in response thereto, the improvement comprising, arcuate stop means intersecting the slots for defining a plate reference position for each cell, window means disposed proximate the arcuate stop for admitting X-radiation but excluding light from the detector cells, resilient sealing means associated with the window and disposed to protrude past the plate reference position into the cells when uncompressed, the resilient sealing means being disposed to engage the plurality of collimator plates at discrete locations to effect an optical seal between adjacent cells, and resilient lock means adapted to bear at discrete locations against each of a plurality of plates for individually urging each of the plurality of plates against the arcuate stop and into the resilient sealing means to lock and seal the associated detector cells.

4,414,474

CORRECTOR FOR AXIAL ABERRATIONS IN ELECTRON OPTIC INSTRUMENTS

Albert V. Crewe, Palos Park, Ill., assignor to University Patents, Inc., Norwalk, Conn.

Filed Feb. 17, 1982, Ser. No. 349,442
Int. Cl.[3] H01J 3/12, 37/153
U.S. Cl. 250—396 R 6 Claims



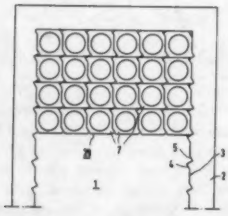
1. In an electron optic system, having a source of electrons, the improvement in the system for correction of third-order aberrations such that the point resolving power is reduced to less than 1.0 Angstrom unit, comprising: aligned first and second spaced sextupole means and an intermediately disposed magnetic field lens means, all interposed between first and second conventional condenser lens means, such that the respective sextupole means are imaged on each other.

4,414,475

SHIELDING CONTAINER FOR STORING WEAK TO MEDIALLY ACTIVE WASTE

Gerhard Kratz, Rodgau, and Erich Marr, Mörfelden-Walldorf, both of Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Fed. Rep. of Germany

Filed Oct. 6, 1981, Ser. No. 309,069
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1980, 3038592
Int. Cl.[3] G21F 5/00; G21C 19/40
U.S. Cl. 250—506.1 11 Claims



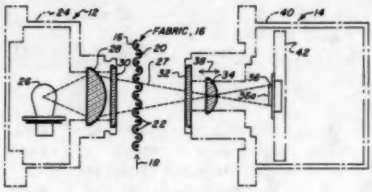
1. Shielding container assembly for storing weak to medially active waste in a storage barrel, comprising a plurality of shielding containers each having massive concrete walls in a substantially square cross section surrounding the storage barrel, each shielding container having two pairs of oppositely-disposed sections, one of said pairs having symmetrical projections formed thereon with a given shape extended outward from said substantially square cross section and the other of said pairs having recesses with said given shape formed therein extended into said substantially square cross section, each of said projections being releasably anchored in a respective one of said recesses of an adjacent shielding container when stacking said shielding containers in a horizontal row.

4,414,476

VARIABLE ANGLE OPTICAL SENSING SYSTEM FOR DETERMINING THE ORIENTATION OF WEFT THREADS

Edward L. Maddox, Lexington, Mass., and Thomas E. Pitts, Warren, R.I., assignors to SW Industries, Inc., Providence, R.I.

Filed Jun. 19, 1981, Ser. No. 275,203
Int. Cl.[3] G01N 21/88
U.S. Cl. 250—563 14 Claims



1. In a system for sensing the angular orientation of weft threads in a web that is moving in a first direction, said system including a light source that directs a beam of light onto the web and optical means for forming an image of the weft threads generated by transmitted light from said light source, the improvement comprising,

a sensor array disposed to receive said transmitted light image on a face thereof, said face including a plurality of elongated, narrow photosensitive areas that are radially aligned with respect to one another, each of said areas generating an electrical signal that is responsive to the total intensity of said transmitted light incident upon it, the width of each of said areas being selected so that the movement of said weft threads past said array which are substantially aligned with one of said areas produces a detectable degree of modulation of said electrical signal, and the length of each of said areas being selected to provide a good signal-to-noise ratio for said electrical signal; and

means for rotating said light source and said sensor array in coordination with one another and in a plane generally transverse to the direction of travel of said web to vary the angle of incidence of said light beam with respect to said web.

4,414,477

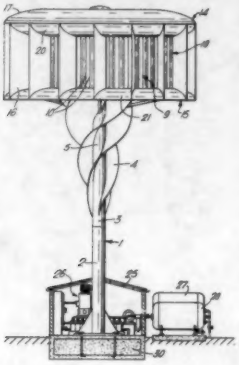
WIND ENERGY CONVERTOR

Anthony J. S. Mewburn-Crook, and Dominic T. Mewburn-Crook, both of 16 Avenue Rd., Isleworth, Middlesex, TW7 4JN, England

Filed Mar. 15, 1982, Ser. No. 357,867
Int. Cl.[3] F03D 9/00
U.S. Cl. 290—55 18 Claims

1. A wind energy convertor comprising an upstanding column; a fan which is supported on the upper end of the column in such a way that the fan is freely rotatable about the axis of the column and which comprises a plurality of circumferentially spaced radially extending blades; and, supported by, and freely rotatable about the axis of, the column, a substantially circular turbine which surrounds and is radially spaced from an uppermost part of the column and which comprises a plurality of circumferentially spaced blades extending lengthwise with respect to the column, the arrangement being such that wind blowing against the blades of the turbine will drive the turbine rotatably about the axis of the column to cause wind to be

directed upwardly within the turbine to drive the fan rotatably about the axis of the column in the same rotational direction as



the turbine, thereby converting the energy of the wind into rotational mechanical energy.

4,414,478

ELECTRONIC SWITCHING DEVICE

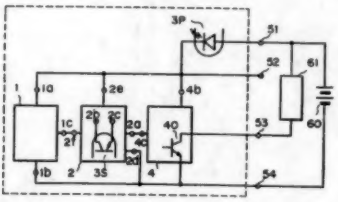
Kenji Ueda, Otsu, and Kiyoshi Miyamoto, Nagaokakyo, both of Japan, assignors to Omron Tateisi Electronics Co., Nagaokakyo, Japan

Filed Mar. 5, 1981, Ser. No. 240,939

Claims priority, application Japan, Mar. 3, 1980, 55-36426; Mar. 3, 1980, 55-36427; Mar. 3, 1980, 55-36428; May 16, 1980, 55-65131; May 16, 1980, 55-65132

Int. Cl.³ H01H *35/00*

U.S. Cl. 307—116 **7 Claims**



1. Electronic switching device comprising external terminal means for connecting the switching device with an external power source for power supply to the device and with a load for switching the same,

detection circuit means for developing a detection signal,

polarity switching means connected to said detection circuit means for switching a polarity of said detction signal to a predetermined polarity and generating a switched signal, and

output circuit means connected to said polarity switching means for, in response to said switched signal, switching said load which is connected to said external terminal means,

said polarity switching means including an optocoupler member which includes a first light projecting element connected to said external terminal means and a first light receiving element infterposed between said detection and output circuit means,

whereby, when said first light projecting element is energized, the polarity of said detection signal is switched into said predetermined polarity by said first light receiving element.

4,414,479

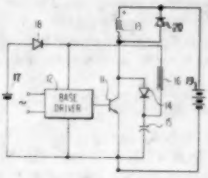
LOW DISSIPATION SNUBBER FOR SWITCHING POWER TRANSISTORS

James W. B. Foley, Peru, Mass., assignor to General Electric Company, Salem, Va.

Filed Jul. 14, 1981, Ser. No. 283,219

Int. Cl.³ H03K *17/04, 17/60*

U.S. Cl. 307—253 **5 Claims**



1. An improved snubber circuit for use in a switching transistor circuit including at least one power transistor, the transistor circuit being of the type responsive to control signals for rapidly switching the transistor between conductive and non-conductive states to alternately connect and disconnect a load and a power source, comprising:

(a) a base drive circuit connected between a base terminal and an emitter terminal of the transistor; and

(b) a diode, a capacitor and a resistor, said diode and said capacitor being connected in series between a collector terminal and the emitter terminal of the transistor, and said resistor being connected at one end to the junction of said diode and said capacitor and at the other end to said base drive circuit in a manner such that current flow from said capacitor through said resistor is exclusively to said base drive circuit, said resistor providing a discharge path for said capacitor to supply base boost to said power transistor when said power transistor is switched to a conductive state.

4,414,480

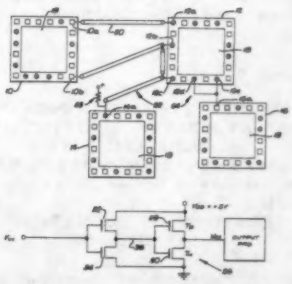
CMOS CIRCUIT USING TRANSMISSION LINE INTERCONNECTIONS

John J. Zasio, Sunnyvale, Calif., assignor to Storage Technology Partners, Santa Clara, Calif.

Filed Dec. 17, 1981, Ser. No. 331,524

Int. Cl.³ H03K *17/10, 19/017, 19/094*

U.S. Cl. 307—443 **12 Claims**



1. A high speed circuit for use in digital computers or the like, comprising:

a first integrated circuit chip including a plurality of CMOS output circuits;

a second integrated circuit chip including a plurality of CMOS receiver circuits; and

a first transmission line connected between an output circuit and a receiver circuit, wherein the transmission line is not terminated at the receiver circuit end to thereby result in a reflection of a signal from the output circuit, said reflected signal combining with the signal from the output circuit to increase the amplitude of the signal at the receiving circuit and thereby reduce the current requirements of the output circuit, wherein the output impedance of the output circuit is approximately equal to the characteristic impedance of the transmission line so as to provide termination for the end of the transmission line connected to the output circuit to thereby absorb reflected signals.

4,414,481

STATOR FOR ROTATING ELECTRIC MACHINE

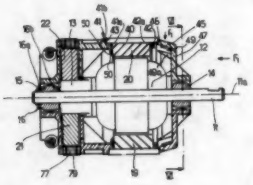
Gerrit de Jong, Maurepas, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Continuation of Ser. No. 60,738, Jul. 25, 1979, abandoned. This application Jun. 2, 1981, Ser. No. 269,552

Claims priority, application France, Jul. 31, 1978, 78 22642

Int. Cl.³ H02K *5/00*

U.S. Cl. 310—42 **10 Claims**



1. In a rotating electric machine, a stator comprising induction means and a casing formed of two separable non-magnetic elements, a magnetizable integral cylindrical holding piece disposed outside said casing for holding said two separable non-magnetic elements in abutment one with the other, said magnetizable integral holding piece forming a closed circuit for the magnetic field flux of said induction means, said separable non-magnetic elements of the casing being identical with each other and applied one against the other along a plane passing through the axis of the rotating machine, each elements of the casing having first and second outer axial abutments, between which the holding piece is maintained, the first abutment being stationary and the second abutment being resilient in a radial direction so that it may be retracted for allowing the axial mounting of said holding piece on said casing.

4,414,482

NON-RESONANT ULTRASONIC TRANSDUCER ARRAY FOR A PHASED ARRAY IMAGING SYSTEM USING¼ λ PIEZO ELEMENTS

George K. Lewis, San Jose, and Michael Buchin, Palo Alto, both of Calif., assignors to Siemens Gammasonics, Inc., Des Plaines, Ill.

Filed May 20, 1981, Ser. No. 265,623

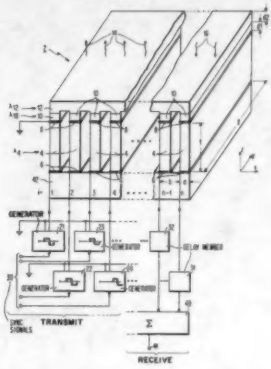
Int. Cl.³ H01L *41/08*

U.S. Cl. 310—334 **12 Claims**

1. In a phased array transducer for transducing ultrasound of a predetermined frequency, comprising

(a) a plurality of piezoelectric elements having all the same natural frequency, each of said elements having a first and a second surface which are located opposite to each other, and

(b) a first and a second electrode provided on said first and said second surface, respectively, of each of said elements, the improvement wherein a distance between said first and second surface is one quarter of the wavelength that ultrasound of said predetermined frequency has in said element between said electrodes.



4,414,483

SPARK PLUG AND MANUFACTURING PROCESS THEREOF

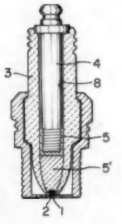
Kanemitsu Nishio, Komaki; Shunichi Takagi, Tajimi, and Yasuhiko Suzuki, Nagoya, all of Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed Sep. 10, 1980, Ser. No. 185,955

Claims priority, application Japan, Sep. 14, 1979, 54-118047

Int. Cl.³ H01T *13/20*; F23Q *3/70*

U.S. Cl. 313—136 **30 Claims**



1. A spark plug, comprising:

a refractory insulator with a center bore having a bottom end provided with a small end bore having a smaller diameter than the center bore; and

a center discharge electrode therein which has a discharge end of semispherical or semispheroidal surface and is formed by melting metallic powder charged in said small end bore and/or in the bottom end of said center bore.

4,414,484

ELECTRIC INCANDESCENT LAMP

Victor R. Notelteirs, and Stephanus J. Claessens, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 10, 1981, Ser. No. 272,437

Claims priority, application Netherlands, Jul. 14, 1980, 8004030

Int. Cl.³ H01J *1/88, 19/42*; H01K *1/18*

U.S. Cl. 313—273 **1 Claim**

1. An electric incandescent lamp having a light-transmitting tubular lamp envelope having first and second ends, first and

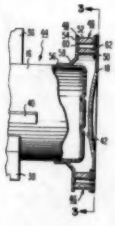
second conductors disposed respectively at said first and second ends, a filament stretched longitudinally in the lamp envelope between said ends, said filament having respective ends electrically connected to said first and second conductors, said envelope being sealed respectively at said first and second ends in a vacuum-tight manner around said first and second conductors, said filament having a plurality of light-emissive axial sections of helically wound tungsten wire, adjacent light-emissive axial sections being connected to each other by an axial section of the same piece of tungsten wire from which said light-emissive axial sections are wound, each of said axial sections of said piece of tungsten wire extending substantially in the longitudinal direction of the lamp envelope, and a wire of a less noble metal than tungsten being wound around said axial sections of the same piece of tungsten wire between adjacent light-emissive axial sections.

4,414,485

CONTROL-SCREEN ELECTRODE SUBASSEMBLY FOR AN ELECTRON GUN AND METHOD FOR CONSTRUCTING THE SAME

Frank D. Marschka, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 23, 1981, Ser. No. 276,264
Int. Cl.³ H01J *29/46, 9/04*
U.S. Cl. 313—451 **5 Claims**



1. In an electron gun for use in a cathode-ray tube, said gun including a cathode assembly, a control electrode, a screen electrode and at least one other electrode, each of said electrodes having an electron beam aperture therein, said beam apertures being aligned for the passage of an electron beam therethrough, the improvement comprising,

said screen electrode having a plurality of control electrode alignment apertures disposed around the periphery thereof, and

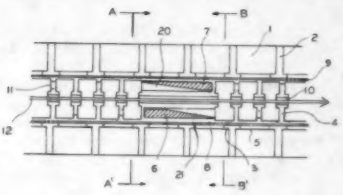
a plurality of insulative support assemblies, each of said support assemblies including a first support plate and a ceramic member having two ends, said first support plate being bonded to one end of said ceramic member, the other end of said ceramic member being referenced to one of said alignment apertures disposed around the periphery of said screen electrode and interconnected thereto, each of said first support plates including a locating portion being located on a contour defining the outer shape of said control electrode, said locating portions being attached to said control electrode.

4,414,486

COUPLED CAVITY TYPE TRAVELING WAVE TUBE

Kunio Tsutaki, and Takao Kageyama, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jul. 7, 1981, Ser. No. 281,297
Claims priority, application Japan, Jul. 9, 1980, 55-93441
Int. Cl.³ H01J *25/34*
U.S. Cl. 315—3.6 **15 Claims**



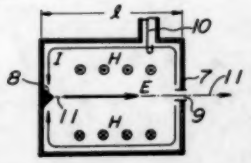
1. A coupled cavity type traveling wave tube having an electron gun and a collector, said tube comprising a plurality of coupled cavity type slow-wave circuit means, a first and second of said coupled cavity type slow-wave circuit means being mounted with separation to provide therebetween an electron beam drift space, two non-reflective waveguides elongating in the direction parallel to an axis of said tube along said electron beam drift space and disposed on opposite sides of said electron beam drift space to sandwich said electron beam drift space therebetween, and an electron beam focusing device having a plurality of permanent magnets and a plurality of pole pieces which are alternately and periodically arrayed in the direction parallel to said axis of said tube to continuously cover said first slow-wave circuit means, said two non-reflective waveguides, and said second slow-wave circuit means without omission of any magnet, one of said non-reflective waveguides being coupled to said first slow-wave circuit means and the other being coupled to said second slow-wave circuit means with respect to a high frequency wave.

4,414,487

SUPERCONDUCTING ELECTRON BEAM GENERATOR

Tsutomu Yamashita, and Jinichi Matsuda, both of Nagaoka, Japan, assignors to Technological University of Nagaoka, Nagaoka, Japan

Filed Oct. 14, 1981, Ser. No. 311,238
Claims priority, application Japan, Dec. 29, 1980, 55-187596
Int. Cl.³ H01J *23/065*
U.S. Cl. 315—5 **4 Claims**



1. A superconducting electron beam generator, comprising:

a cavity resonator having a hollow cylindrical portion, a first end plate secured to one end of said cylindrical portion and a second end plate secured to the other end of said cylindrical portion, said second end plate having an aperture in the central part thereof, an electric field being applied to said resonant cavity; and

a metal member formed of a material having superconductive properties secured to said first end plate and projecting into said cavity, said superconductive metal member including a tip portion positioned opposite and spaced from said aperture by a distance on the order of the length of said cavity, the tip of said superconductive metal member being positioned within said cavity resonator in a region where said electric field has a maximum intensity and being maintained in a superconducting state, whereby a high energy electron beam is emitted from the tip of said superconductive metal member and passes through the aperture in said second end plate.

4,414,488

APPARATUS FOR PRODUCING A DISCHARGE IN A SUPERSONIC GAS FLOW

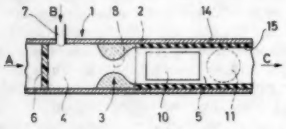
Peter Hoffmann, Stuttgart; Helmut Hügel, Sindelfingen; Wolfgang Schall, Leinfelden-Echterdingen, and Schock, Wolfram, Sindelfingen, all of Fed. Rep. of Germany, assignors to Deutsche Forschungs- und Versuchsanstalt für Luft-und Raumfahrt e.V., Bonn, Fed. Rep. of Germany

Filed Jun. 26, 1980, Ser. No. 163,281

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1979, 2952046

Int. Cl.[3] **H01J** *7/46, 19/80*

U.S. Cl. 315—39 **7 Claims**



1. Apparatus for producing a discharge in a supersonic gas flow comprising:

(a) a waveguide;

(b) a channel for gas flow formed within said waveguide;

(c) means for causing gas flow through the channel;

(d) a microwave generator connected to said waveguide for propagating microwaves substantially in the direction of gas flow;

(e) a supersonic nozzle in the channel for expansion and simultaneous acceleration of the gas to supersonic speed, said nozzle dividing the channel into an upstream plenum and a downstream low pressure region;

(f) said nozzle comprising a low-loss dielectric material; and

(g) dielectric material placed adjacent the interior wall of said waveguide to concentrate gas flow in the region of high field strength.

4,414,489

COMPACT ELECTRIC DISCHARGE LAMP-AND-BALLAST UNIT, AND PLUG-IN BALLAST MODULE THEREFOR

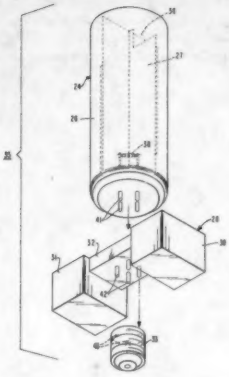
Robert G. Young, Nutley, N.J., assignor to North American Philips Electric Corp., New York, N.Y.

Filed Nov. 4, 1981, Ser. No. 318,224

Int. Cl.[3] **H01J** *7/44, 13/46, 17/34, 19/78, 23/16, 29/96;* **H01K** *1/62*

U.S. Cl. 315—51 **20 Claims**

1. As a new article of manufacture adapted for use as a detachable ballast means for a compact electric discharge lamp, an elongated module having a medial segment and a pair of laterally-extending offset segments each of which contains electrical components that comprise parts of the ballast circuit, the thickness and width dimensions of said module being less



than the length dimension thereof and said medial segment having plug-in type contact means that is connected to said electrical components and engageable in a direction transverse to the longitudinal axis of the module.

4,414,490

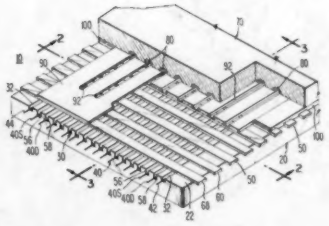
DISPLAY PANEL

Edgar L. Harvey, Jamesburg, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 8, 1982, Ser. No. 355,677

Int. Cl.[3] **H05B** *37/00, 39/00*

U.S. Cl. 315—169.4 **7 Claims**



1. A display panel comprising

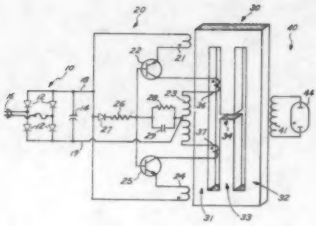
a gas-filled envelope made up of a glass base plate and a glass viewing face plate,

anode and cathode means forming a plurality of columns of gas cells, the first, third, fifth, seventh, etc. columns of gas cells including both scan cells which do not perform a display function and display cells which perform a display function, the second, fourth, sixth, eighth, etc. columns of cells including only scan cells which do not perform a display function.

4,414,491
CURRENT LIMITING POWER SUPPLY FOR ELECTRON DISCHARGE LAMPS

William J. Elliott, Zephyr Cove, Nev., assignor to Quietlite International, Ltd., Reno, Nev.

Filed Aug. 10, 1981, Ser. No. 291,394
Int. Cl.³ H05B 37/00
U.S. Cl. 315—282 5 Claims



1. A current limiting power supply comprising, in combination,

a ferromagnetic transformer core structure, at least a portion of which comprises a magnetically saturable material, comprising first, second and third magnetic flux paths joined at one of their respective ends at a first common junction and joined at their opposing ends at a second common junction,

a primary winding wound about the first of said paths,

a secondary winding wound about the second of said paths,

an auxilliary winding wound about the third of said paths,

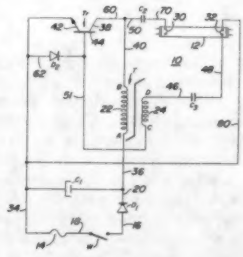
a semiconductor switching circuit having its input connected to a source of electrical energy and havings its output connected to supply a high-frequency alternating current to the series combination of said primary winding and said auxilliary winding, said semiconductor switching circuit including at least one control winding for controlling the switching time of said semiconductor circuit in response to the saturation of said saturable material, and

a load circuit connected to said secondary winding.

4,414,492
ELECTRONIC BALLAST SYSTEM

Jacques M. Hanlet, Loxahatchee, Fla., assignor to Intent Patent A.G., London, England

Filed Feb. 2, 1982, Ser. No. 344,155
Int. Cl.³ H05B 37/00
U.S. Cl. 315—290 36 Claims



1. An electronic ballast system connected to an AC power source for a gas discharge tube having a first and second filament, comprising:

(a) a first capacitor electrically coupled in series to said first filament of said gas discharge tube;

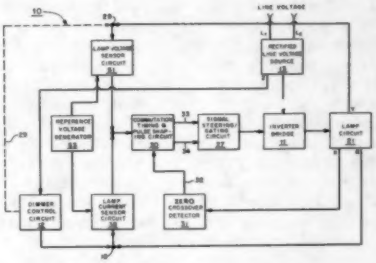
(b) a transistor having a base, emitter, and collector, said collector being connected to said first capacitor; and,

(c) transformer means having a primary winding coupled on a first end to said AC power source and on a second end to said first capacitor and said collector of said transistor, and a secondary winding coupled on opposing ends thereof in positive feedback relation to said base of said transistor and said emitter of said transistor, said primary winding being coupled in series relation with a parallel combination of (1) said emitter and collector of said transistor, and (2) said series coupled first capacitor and said gas discharge tube.

4,414,493
LIGHT DIMMER FOR SOLID STATE BALLAST

William H. Henrich, Sparta, Tenn., assignor to Thomas Industries Inc., Louisville, Ky.

Filed Oct. 6, 1981, Ser. No. 309,086
Int. Cl.³ G05F 1/00; H05B 37/02
U.S. Cl. 315—308 12 Claims



1. In a high frequency solid state ballast for energizing gaseous discharge lamp means, a dimming circuit for varying the current in said gaseous discharge lamp means comprising:

an inverter circuit for receiving power from a line source and generating a high frequency inverter signal, said inverter circuit coupled to said lamp means for providing said high frequency inverter signal thereto;

first detector circuit means responsive to signals in said lamp means for generating a timing signal in timed relation with said inverter signal;

reference voltage generator means for generating a reference voltage;

current sensor circuit means coupled to said lamp means and responsive to the current flowing therein and coupled to said reference voltage source for receiving and comparing said reference voltage with a signal representing the current in said lamp means and for generating an output signal in response to said comparison;

control logic means responsive to said timing signal and said output signal for actuating said inverter circuit to regulate the current in said lamp means;

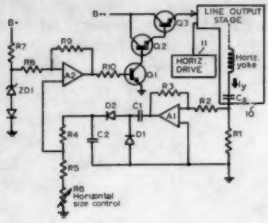
a current source derived from said line source; and

first variable control means coupled to said current source and to said current sensor circuit means and said lamp means for generating a dimming control signal and combining said dimming control signal with said signal representing the current in said lamp means for providing a composite control signal to said current sensor circuit means wherein said composite control signal is compared with said reference voltage for selectively varying the output signal provided to said control logic means in actuating said inverter circuit and controlling the intensity of said gaseous discharge lamp means.

4,414,494
REGULATION OF THE SCAN WIDTH OF A RASTER SCANNED CRT DEFLECTION SYSTEM

Terrance C. Schmidt, Waterloo, Canada, assignor to Electrohome Limited, Kitchener, Canada

Filed Apr. 6, 1981, Ser. No. 251,517
Int. Cl.³ H01J *29/70, 29/72*
U.S. Cl. 315—395 **5 Claims**



1. In combination with a horizontal scanning system for a CRT, said system being of the resonant shunt efficiency type and including a damper diode, a tuning capacitor, a decoupling capacitor, switching means and a horizontal deflection coil; means for supplying a variable frequency drive signal to said scanning system to produce a horizontal scan of variable frequency; a variable output voltage power supply for supplying a variable power supply voltage to said horizontal scanning system; means for deriving an error signal indicative of a change in magnitude of the peak to peak deflection current in said coil from a predetermined magnitude; and means for supplying said error signal to said variable output voltage power supply to decrease said voltage in response to an increase in said magnitude of said peak to peak deflection current and to increase said voltage in response to a decrease in said magnitude of said peak to peak deflection current, thereby to maintain said magnitude of said peak to peak deflection current substantially constant regardless of changes in frequency of the horizontal scan.

4,414,495
SYNCHRONISM EQUIPMENT FOR GEAR CUTTING MACHINES

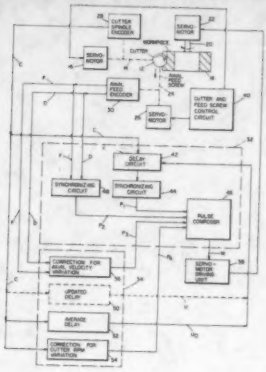
Masaoki Sumi, and Tomoyuki Doi, both of Shiga, Japan, assignors to Kashifuji Works, Ltd., Kyoto, Japan

Filed Oct. 27, 1981, Ser. No. 315,417
Int. Cl.³ G05B *19/24*
U.S. Cl. 318—571 **14 Claims**

1. Apparatus for controlling synchronism between a rotating cutter and a rotating workpiece of a gear cutting machine, said apparatus comprising

means for receiving a cutter rotation signal representing rotation of said cutter, and

workpiece synchronizing means for processing said cutter rotation signal to provide a command signal for driving said workpiece, said synchronizing means comprising a timing means for delaying or advancing in time the influence of said cutter rotation signal on said command signal by an amount which is dependent upon a predetermined estimate of a workpiece delay time and which is selected to reduce synchronism errors due to said delay time, said workpiece delay time being the delay between application

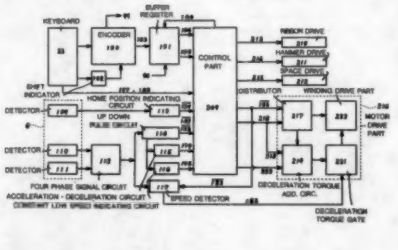


of said command signal and the corresponding movement of said workpiece.

4,414,496
ELECTRONIC TYPEWRITER AND ITS CONTROL APPARATUS

Tomoyoshi Watanabe, Chiryu; Takanobu Hirayama, Chita; Motokazu Yoshimura, Nagoya; Kenji Mizuno, Nagoya, and Yukio Inukai, Nagoya, all of Japan, assignors to Brother Industries, Ltd., Nagoya, Japan

Division of Ser. No. 13,329, Feb. 21, 1979, abandoned. This application Oct. 27, 1980, Ser. No. 204,675
Claims priority, application Japan, Mar. 7, 1978, 53-25856
Int. Cl.³ H02K *29/04*
U.S. Cl. 318—696 **1 Claim**



1. In a step motor arrangement which drives a rotor member, said step motor arrangement having clock pulse means and pulse energizing means for energizing said step motor arrangement to various stages of energization, said rotor member having a defined home position, said step motor arrangement driving said rotor member stepwise one or a number of desired angular rotational steps from said home position to a desired stable last step position, where each step spans a predetermined angle, all of the step angles being equal, a step motor control system for accelerating the rotational speed of said rotor member during an acceleration phase as it turns from said home position to a point at least prior to one-half of the step angle before said last step position and decelerating the rotational speed of the rotor member during a deceleration phase for the remaining distance, as it travels to said desired last step position, and wherein information as to said last step position is provided by utilization means, said step motor control system comprising in combination:

(a) start-stop pulse means (300) coupled to the utilization means, said start-stop pulse means (300) generating a first pulse (328) to start the rotation of said step motor arrangement, said start-stop pulse means including one-shot means (200) and a pulse carrying circuit (201, 202, 203, 204) said pulse carying circuit being coupled to said step motor arrangement and providing an input drive pulse (206) and an initiating signal (207) to a gate (203) which permits a driving clock pulse signal (205) from the clock pulse means to drive the step motor arrangement;

(b) a detecting and signal giving circuit (6, 112) including a home position indicating circuit (113), said detecting and signal giving circuit detecting a plurality of angular step positions of said step motor arrangement and generating a position signal corresponding to each of said angular step positions, said detecting and signal giving circuit further including a shutter disc (6*a*) so coupled to said step motor arrangement as to rotate with said rotor member (3), light emitting means (109*a*, 110*a*, 111*a*) disposed on one side of said shutter disc (6*a*) cooperating with light sensitive detection means (109, 110, 111) on the other side of said shutter disc (6*a*), with direction reading means (122, 124) providing clockwise and counter-clockwise direction-of-rotation signal information (119, 121, 123, 125);

(c) an accelerate-decelerate circuit (115) coupled to said detecting and signal giving circuit (6, 112), said accelerate-decelerate circuit generating an acceleration-deceleration pulse signal (170) in response to the position signal at each of said step positions, said acceleration-deceleration pulse signal being given at least more than a half-step but less than one step of rotation before said last step position, said acceleration-deceleration circuit including a speed detector (117), said speed detector (117) receiving said direction-of rotation signal information outputs (119, 121, 123, 125);

(d) drive pulse means (216) including a control part (209) coupled for driving said step motor arrangement according to said first pulse (328) and said acceleration-deceleration pulse signal generated by said acceleration-deceleration circuit, said drive means (216) being coupled to said speed detector (117) receiving a signal (185) therefrom whose strength corresponds to the rotational speed of the rotor member at each step, said drive means (216) including a distributor (217), a deceleration-torque adding circuit (219) and a deceleration torque gate (221), said step motor arrangement having a plurality of windings, said distributor (217) being coupled thereto and providing a signal for energizing at least one of the windings for rotation, and deceleration torque gate (221) being also coupled to said wingings and supplying a flow of energizing force to windings other than the said one winding so as to apply a deceleration torque to the step motor arrangement;

(e) boundry position indicating means (290) coupled to said drive means (216) for indicating the boundry position between the acceleration phase and deceleration phase, including an up-down counter (257) to count the number of clockwise and counter-clockwise steps from the rotor member home position at each step, a compare circuit (259) coupled to said up-down counter (257) and receiving an input as to said last step position from the utilization means, an operating circuit (278) and a divider (279) computing the number of steps to some boundry which is the midpoint of the entire number of steps to go from the home position to the last position, said boundry position indicating means (290) providing a boundry pulse; and

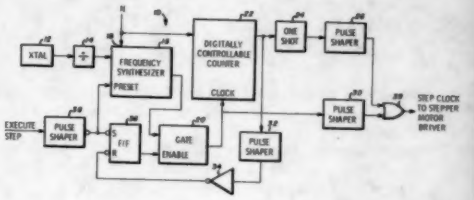
(f) pulse suppressing means (346) with gate means (362, 363, 364, 365, 366, 368, 369) said pulse suppressing means (346) being coupled to said boundry position indicating means (290) and to said driving means (216) for monitoring the feeding of drive pulses and also for suppressing one pulse of said acceleration-deceleration pulse signals in said boundry position so as to change the energization state of the step motor arrangement during the acceleration phase to a lower state of energization at a position at least more than a half step but less than one step before said stable last position and shifting the energization of the step motor arrangement during the deceleration phase to a lower state of energization, said pulse suppressing means (346) including a last signal forming circuit (282) triggered by said boundry pulse, and, said last signal forming circuit (282) supplying a last pulse (218*k*).

4,414,497

DIGITALLY CONTROLLABLE ELECTRONIC DAMPER

Hubert Song, Sunnyvale, Calif., assignor to Verbatim Corporation, Sunnyvale, Calif.

Filed Jan. 22, 1981, Ser. No. 227,180
Int. Cl.³ G05B *19/40*
U.S. Cl. 318—696 **6 Claims**



1. A digitally controllable electronic damper for stepper motors, comprising:

digitally controllable frequency synthesizer means for generating a clock signal of a predetermined control frequency;

first gate means for receiving said clock signal and including an enable input and an output whereby said clock signal is transmitted on said output when a signal is received on said enable input;

digitally controllable counter means responsive to said clock signal on said output of the first gate means for generating a borrow signal after a digitally controllable number of pulses of said clock signal;

delay means responsive to said borrow signal for generating a delayed pulse after a predetermined time;

flip-flop means for generating an enable signal to be provided to said enable input of the first gate means and responsive to an execute signal to generate said enable signal and also responsive to said borrow signal to terminate said enable signal; and

second gate means responsive to said clock signal transmitted by the first gate means and responsive to said delayed pulse for transmitting said clock signal and delayed pulse on an output.

4,414,498

STEPPING MOTOR DRIVE CIRCUIT

Gerald A. Gessner, Munich, Fed. Rep. of Germany, assignor to Advanced Semiconductor Materials Die Bonding, Inc., Chandler, Ariz.

Filed Feb. 23, 1981, Ser. No. 236,840
Int. Cl.³ G05B *19/40*
U.S. Cl. 318—696 **22 Claims**

1. A circuit for driving the motor coils of a stepping motor capable of bidirectional rotation, comprising:

first means for receiving a control signal which when in a first state indicates a first desired direction of rotation and when in a second state indicates a second opposite desired direction of rotation;

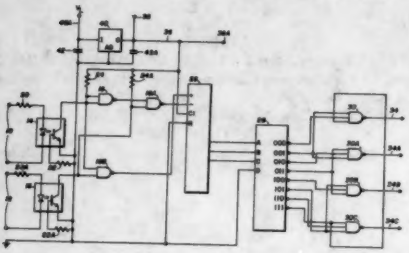
second means for receiving a plurality of stepping pulses;

counting means coupled to said stepping pulses, said counting means incrementing when said control signal is in said first state and decrementing when said control signal is in said second state;

third means coupled to said counting means for decoding selected states of said counting means to produce phase

voltage output pulses during which coil current is supplied to said motor coils;

fourth means coupled to said third means and responsive to said phase voltage output pulses for producing coil current pulses;



fifth means for providing a high-voltage starting pulse at the beginning of each phase voltage output pulse to provide a desired coil current; and

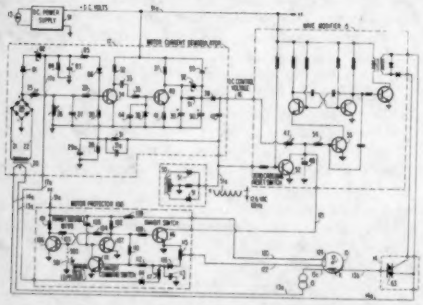
sixth means for maintaining said desired coil current after termination of said high voltage starting pulse for the remainder of said phase voltage output pulse.

4,414,499

MOTOR PROTECTING IMPROVED ENERGY ECONOMIZER FOR INDUCTION MOTORS

Rhey W. Hedges, Ft. Lauderdale, Fla., assignor to Dr. Louis W. Parker, Fort Lauderdale, Fla.

Filed Oct. 14, 1981, Ser. No. 311,122
Int. Cl.³ H02P 5/40
U.S. Cl. 318—798 **15 Claims**



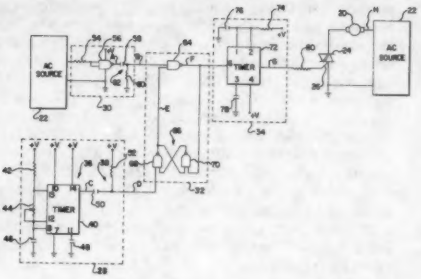
1. A power control system comprising an AC induction motor having a rotor and a stator winding, a sine wave power supply, switching means coupling said power supply to said stator winding to effect rotation of said rotor, said switching means including a controllable wave modifier for applying varying fractions or complete cycles of the sine waves of voltage from said power supply to said stator winding in accordance with the inherent electromechanical properties of said motor and the energy requirements imposed on said motor by the rotor load at any given moment, means for monitoring the magnitude of inrush current to said stator winding for only a brief interval of time each time the current in said stator winding increases from zero, said brief time interval being a small fraction of each alternation from said power supply, said monitoring means including threshold means for providing an output pulse only when the magnitude of said inrush current is in excess of a predetermined value, pulse integrating means for integrating said output pulses, said pulse integrating means being operative to generate a control signal in response to peresistent occurrence of said output pulses for a time period in excess of a predetermined time period, and control means responsive to generation of said control signal by said pulse integrating means for inhibiting said switching means from coupling said power supply to said stator winding thereby to de-energize said stator winding.

4,414,500

VARIABLE MOTOR SPEED CONTROL

John T. Schneider, Apollo, Pa., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Feb. 1, 1982, Ser. No. 344,517
Int. Cl.³ H02P 5/40
U.S. Cl. 318—799 **12 Claims**



1. Apparatus for controlling the speed of a motor comprising:

(a) a switch connected in series with the motor for controllably conducting an A.C. signal to the motor, and

(b) means for controlling the switch which includes:

(1) first means for generating a series of pulses at a frequency which may be varied according to an input signal,

(2) second means for generating a pulse once per cycle at a zero crossing of the A.C. signal,

(3) third means for generating a pulse at said A.C. signal zero crossing if a pulse was produced by the first generating means during the A.C. cycle immediately preceding said zero crossing, and

(4) fourth means responsive to the output of the third generating means for generating a pulse which is supplied to and renders conductive said switch for one complete A.C. cycle.

4,414,501

PROGRAMMABLE SIGNAL AMPLITUDE CONTROL CIRCUITS

James F. Bedard; Charles W. Eichelberger, both of Schenectady, and Salvatore F. Nati, Jr., Syracuse, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed May 26, 1981, Ser. No. 267,274
Int. Cl.³ G01R 27/14; G05F 1/58
U.S. Cl. 323—280 **15 Claims**

1. A circuit for providing an output signal of controllable amplitude responsive to the data contained in at least one externally-provided digital control signal, comprising:

oscillator means for providing a periodic waveform having a selected frequency and a substantially constant amplitude;

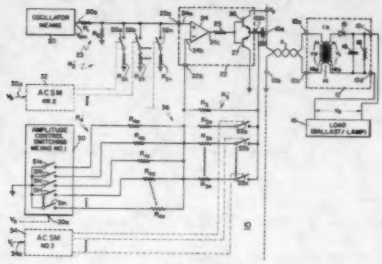
an operational amplifier having an inverting input, a non-inverting input and an output;

first voltage divider means for providing the output waveform of said oscillator means to a selected one of said operational amplifier inverting and non-inverting inputs with an amplitude selected from a first plurality of selectable values, each less than the substantially constant amplitude of the oscillator means output waveform;

second voltage divider means coupled to at least said opera-

tional amplifier output and a remaining one of said inverting and non-inverting inputs, for controlling the gain of said operational amplifier to said signal from said first voltage divider means, to a selected one of a second plurality of selectable values;

means coupled to at least one of said first and second voltage



divider means for controllably switching the values thereof responsive to said at least one control signal; and

a circuit output terminal coupled to said operational amplifier output, at which appears said circuit output signal with the frequency of said oscillator means output waveform and an amplitude controlled by the selected one of the first and second voltage divider means values.

4,414,502

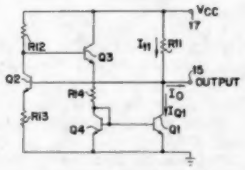
CURRENT SOURCE CIRCUIT

Thomas S. W. Wong, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jul. 20, 1981, Ser. No. 285,180

Int. Cl.³ G05F *3/20*

U.S. Cl. 323—315 **9 Claims**



1. A current source circuit comprising

a first resistance element coupled between a first voltage supply source terminal and an output node,

a first transistor forming a collector-emitter current path between said output node and a second voltage supply source terminal,

a first current path having a second resistance element coupled to said first voltage supply source terminal, a third resistance element coupled to said second voltage supply source terminal, and a second transistor forming a collector-emitter current path between said first and second resistance elements, and having a base electrode coupled to said output node,

a second current path having a fourth resistance element, a third transistor forming a collector-emitter current path between said first voltage supply source and said fourth resistance element, and having a base electrode coupled to a collector electrode of said second transistor, and a fourth transistor in a diode-connected mode forming a collector-emitter current path between said fourth resistance element and said second voltage supply source terminal, and having a base terminal coupled to a base electrode of said first transistor.

4,414,503

LOW VOLTAGE REGULATION CIRCUIT

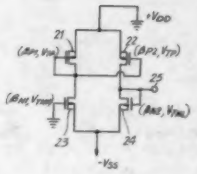
Masami Hashimoto, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Dec. 7, 1981, Ser. No. 328,348

Claims priority, application Japan, Dec. 10, 1980, 55-174162; Sep. 4, 1981, 56-139548

Int. Cl.³ G05F *3/08*

U.S. Cl. 323—315 **19 Claims**



1. A low voltage regulation circuit comprising:

a power supply having a positive and a negative terminal;

a first and second branch circuit in parallel across said power supply, each said branch circuit including a N channel and a P channel transistor with source/drains in series, the channel transistors of one conductivity type having different threshold voltages, the channel transistors of the other conductivity type having the same threshold voltages;

a load terminal, said load terminal being connected in circuit with said parallel branch circuits and being adapted for connection with one end of a load, load current flowing from said load terminal through said connected load when the other end of said load connects to one said terminal of said power supply, the voltage between said load terminal and said one power supply terminal being the difference in threshold voltages of said one conductivity type of channel transistors.

4,414,504

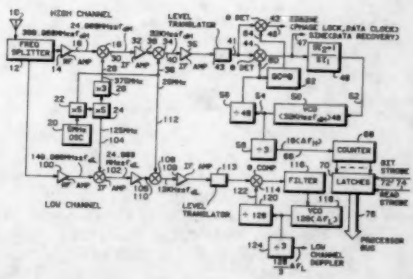
FRACTIONAL DOPPLER COUNTING

Howard L. Kennedy, Phoenix, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Nov. 5, 1980, Ser. No. 204,097

Int. Cl.³ G01R *23/02*

U.S. Cl. 324—78 R **6 Claims**



1. An improvement in a system for measuring cycle counts of an unknown frequency varying signal, comprising a phase locked loop having a phase detector, the phase detector having at least an output terminal and two input terminals, and a controlled oscillator having at least an output signal terminal, the improvement comprising:

an N factor divider circuit having an input terminal and an output terminal, said input terminal of said divider being

connected to the output terminal of the controlled oscillator, said output terminal of said divider being connected to one of the two input terminals of the phase detector; and

a counter having an input terminal and a plurality of output terminals, said input terminal of said counter being connected to the output terminal of the controlled oscillator, said plurality of output terminals being adapted for producing an output signal responsive to a multiple of the cycle count of the unknown varying frequency, said multiple being equal to N.

4,414,505

MICROWAVE INSTANTANEOUS FREQUENCY MEASUREMENT APPARATUS

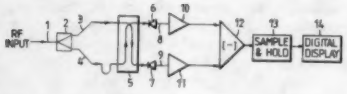
Harry Cuckson, Farnham, and Peter D. Curtis, Pangbourne, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Jul. 21, 1981, Ser. No. 285,524

Claims priority, application United Kingdom, Jul. 25, 1980, 8023981

Int. Cl.³ G01R *25/00*

U.S. Cl. 324—85 **3 Claims**



1. Microwave instantaneous frequency measurement apparatus comprising an RF input signal power divider for dividing said input signal into first and second signals, time delay means for introducing time delay into said first signal, a three decibel hybrid coupler connected to receive said delayed first signal and said second signal and arranged to quadrature sum and difference said delayed first signal and said second signal, a first logerithmic amplifier connected to receive quadrature summed output from said coupler, a second logarithmic amplifier connected to receive quadrature differenced output from said coupler, and a subtractor connected to receive output signals from both said amplifiers and to subtract the one from the other.

4,414,506

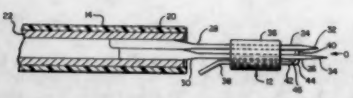
ELECTRICAL CIRCUIT TEST PROBE

Jack M. Kelley, 119 S. Wasson, Apt. 21, Coos Bay, Oreg. 97420

Filed Dec. 30, 1980, Ser. No. 221,520

Int. Cl.³ G01R *27/26*; H01R *29/00*

U.S. Cl. 324—158 P **13 Claims**



2. The test probe apparatus in claim 1 wherein securing means component is a hook.

4,414,507

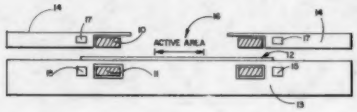
COPPER EMBEDDED FERRITE COIL ARRANGEMENT FOR SUPPLYING UNIFORM ROTATING FIELD IN FULL FREQUENCY RANGE FOR TESTING MAGNETIC BUBBLE DEVICES

Thomas T. Chen, Placentia, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 29, 1980, Ser. No. 191,546

Int. Cl.³ G01R *33/12*; G11C *19/08*

U.S. Cl. 324—210 **15 Claims**



1. A coil arrangement for testing magnetically operative devices comprising:

means for mounting a magnetically operative device to be tested by an external magnetic field;

first and second coil means disposed symmetrically with respect to the plane of said device, with said first and second coil means on opposite sides of the plane of said device, said coil means functioning to produce an external magnetic field between said first and second coil means by producing magnetic lines which extend along said plane of said device for testing said device;

characterized in that said first coil means is embedded within a metallic electrically conductive body for confining the magnetic field lines to a predetermined region along said plane of said device, so that at low magnetic field frequencies, said first and second coil means cooperate together to produce said external magnetic field, and so that at high magnetic field frequencies, said second coil means produces a magnetic field reinforced by a reflected magnetic field from said electrically conductive body for producing said external magnetic field.

4,414,508

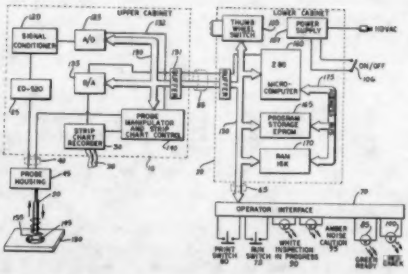
METHOD AND APPARATUS FOR AUTOMATED INSPECTION OF FASTENER HOLES BY EDDY CURRENT

Hubert B. Davis, Tucker; Bonner W. Staff, Acworth, and James A. Willis, Smyrna, all of Ga., assignors to Lockheed Corporation, Burbank, Calif.

Filed Mar. 30, 1981, Ser. No. 249,016

Int. Cl.³ G01N *27/82*; G01R *33/12*; G05B *19/02*

U.S. Cl. 324—238 **17 Claims**



1. In an apparatus for detecting discontinuities proximate the surface of a hole in a workpiece, said apparatus including a probe for radiating said workpiece with a magnetic field for inducing eddy currents in said workpiece, and said apparatus including detection means for providing input signals indica-

tive of values of said eddy currents, said input signals assuming a characteristic signature in response to each occurrence of a detection by said detection means of one of said discontinuities, the improvement of means for receiving and analyzing said input signals comprising:

first signature detection means operative to provide a first output signal in response to detection of a first one of said characteristic signatures;

timing means for initiating and providing a time window of predetermined duration in response to said first output signal;

second signature detection means operative to provide a second output signal in response to detection of a second one of said characteristic signatures; and

crack alarm means responsive to said second output signal and said timing means for providing a crack alarm signal upon detection of said second characteristic signature within said time window.

4,414,509

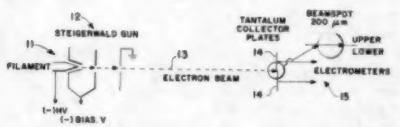
LOW ENERGY ELECTRON MAGNETOMETER USING A MONOENERGETIC ELECTRON BEAM

Jag J. Singh, Yorktown; George M. Wood, Jr., Newport News, both of Va.; Grayson H. Rayborn, Hattiesburg, Miss., and Frederick A. White, Schenectady, N.Y., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 26, 1980, Ser. No. 210,498

Int. Cl.³ G01R *33/02*

U.S. Cl. 324—250 **6 Claims**



1. A low energy electron magnetometer comprising:

means for generating a low energy monoenergetic electron beam that passes through a magnetic field that is to be measured; and

means receiving said monoenergetic electron beam after it has passed through said magnetic field for measuring the deflection of said electron beam caused by said magnetic field whereby said deflection measurement is a measure of the strength of said magnetic field;

wherein said means for generating a low energy monoenergetic electron beam comprises:

means for producing an inert gas atomic beam;

means for exciting the atoms in said atomic beam to the Rydberg state;

means for passing said atomic beam with the atoms in the Rydberg state through a gas to produce low energy electrons; and

means for accelerating said low energy electrons to form said low energy monoenergetic electron beam.

4,414,510

LOW COST SENSING SYSTEM AND METHOD EMPLOYING ANISTROPIC MAGNETO-RESISTIVE FERRITE MEMBER

Miran Milkovic, Scotia, N.Y., assignor to General Electric Company, Somersworth, N.H.

Filed May 28, 1980, Ser. No. 153,886

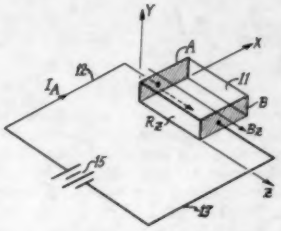
Int. Cl.³ G01R *33/06*; H01L *43/10*

U.S. Cl. 324—252 **32 Claims**

1. A sensor comprising:

a member of ferromagnetic ferrite material having anistropic magneto-resistive properties wherein the resistivity characteristics of the ferrite member vary in response to variations in the strength of a magnetic field applied longitudinally with respect to a selected longitudinal axis of the ferrite member;

means for impressing a magnetic field on the ferrite member which is indicative of a physical phenomenon to be measured with the magnetic lines of flux extending along a longitudinal axis of the ferrite member which exhibits variable magneto-resistive properties;



means for causing a flow of electric current through the said longitudinal axis of the ferrite member along a current path that extends in the same direction or opposite to the direction of the magnetic lines of flux; and

output means coupled to measure changes in the resistivity characteristics of the ferrite member as in indication of the value of a physical phenomenon being measured.

4,414,511

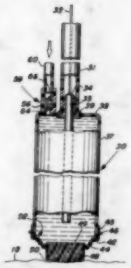
LOW RESISTANCE, FLUID REPLENISHING, REFERENCE CELL AND METHOD FOR USING SAME IN STRUCTURE-TO-SOIL ELECTRICAL SURVEYS

Charles G. Waits, Hanover Park; Karl W. Nicholas, Roselle, both of Ill., and James B. Bushman, Medina, Ohio, assignors to Harco Corporation, Medina, Ohio

Filed Aug. 11, 1980, Ser. No. 176,915

Int. Cl.³ G01V *3/15*; G01N *27/30*; G01R *31/00*

U.S. Cl. 324—347 **34 Claims**



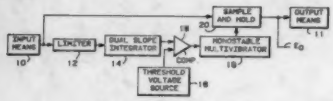
1. A reference cell assembly for conducting electrical earth surveys comprising a liquid-metal cell, means to support the cell and periodically to move the cell to force it against the earth and then to remove it from the earth, and means coupled with respect to the cell for automatically responding to such movement for automatically supplying make-up liquid to the cell.

4,414,512

BROADBAND PEAK DETECTOR

Robert N. Nelson, Scottsdale, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed May 29, 1981, Ser. No. 268,430
Int. Cl.³ H03K 5/153
U.S. Cl. 328—151 10 Claims



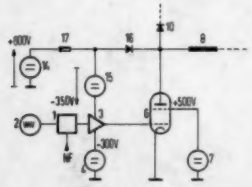
1. An apparatus for generating a quadrature signal in response to an input signal comprising in combination: means for providing an input; a dual slope integrator having a discharging rate equal to twice its charging rate, said integrator having an input coupled to said means for providing an input and said integrator having an output; a reference source; a comparator having a threshold voltage set by said reference source such that said comparator provides an output signal when said integrator is discharged, said comparator having an input coupled to said output of said integrator, said comparator having an output; means for generating a pulse responsive to a leading edge of said output signal from said comparator; and means for providing an output coupled to said means for generating a pulse.

4,414,513

AMPLIFIER STAGE FOR PULSE-WIDTH-MODULATED SIGNALS

Walter Willer, Statzendorf, and Peter Fuchs, Vienna, both of Austria, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Apr. 16, 1981, Ser. No. 254,867
Claims priority, application Austria, Apr. 18, 1980, 2099/80
Int. Cl.³ H03F 1/02
U.S. Cl. 330—204 2 Claims



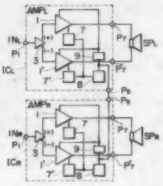
1. Circuit stage for the optimal driving and very highly efficient operation of a tetrode having a control grid and a plate, comprising a grid voltage bias circuit including two partial voltage sources, one of said partial voltage sources being connected to the control grid, and said two partial voltage sources being connected together at a common junction point with opposite polarity with respect to the control grid, and a control diode connected between said common junction point and the plate.

4,414,514

TWO SIGNAL AMPLIFYING SYSTEM

Kunio Seki, Hinode, and Ritsuji Takeshita, Hino, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 20, 1981, Ser. No. 236,502
Claims priority, application Japan, Feb. 20, 1980, 55-19006
Int. Cl.³ H03F 3/26
U.S. Cl. 330—262 8 Claims



1. A two signal amplifying system comprising:
a first BTL amplifier for amplifying a first input signal and a second BTL amplifier for amplifying a second input signal; each of said first and second BTL amplifiers including a first push-pull output circuit for delivering a noninverting output signal, and a second push-pull output circuit for delivering an inverting output signal;
a first speaker load connected between an output terminal of the first push-pull output circuit and an output terminal of the second push-pull output circuit of said BTL amplifier;
a second speaker load connected between an output terminal of the first push-pull output circuit and an output terminal of the second push-pull output circuit of said second BTL amplifier;
a power source;
said first push-pull output circuit of each of said first and second BTL amplifiers including a first output transistor connected between said power source and the output terminal thereof;
said second push-pull output circuit of each of the first and second BTL amplifiers including a second output transistor connected between said power source and the output terminal thereof;
first and second detectors connected with the first and second output transistors, respectively, for detecting the respective operating states of said transistors;
a control circuit having its input connected to receive the outputs of the first and second detectors of each of the first and second BTL amplifiers for rendering nonconductive both of the first and second output transistors of both the first and second BTL amplifiers in case at least one of said first or second output transistors of either of said first or second BTL amplifiers deviates from a predetermined operating range.

4,414,515

CR OSCILLATOR HAVING CONSTANT CURRENT CHARGING SOURCE

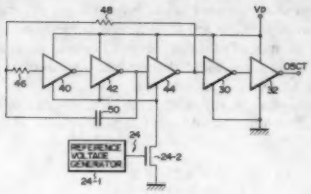
Yasoji Suzuki, Yokosuka, and Kenji Matsuo, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Nov. 10, 1980, Ser. No. 205,629
Claims priority, application Japan, Nov. 22, 1979, 54-150741
Int. Cl.³ H03K 3/03, 3/354
U.S. Cl. 331—111 13 Claims

1. An oscillation circuit comprising:
a CR oscillation section including first and second power source terminals;
an odd number of inverters coupled to said power source terminals, one of said inverters being a first inverter and another of said inverters being a final inverter, each of said inverters having an input terminal, an output terminal, and first and second biasing terminals, said inverters being con-

nected in series such that, except for said first inverter, the input terminal of an inverter is connected to the output terminal of another inverter and the output terminal of said final inverter is not connected to the input terminal of another inverter.

resistive means connected between the output terminal of an odd-numbered inverter in said inverter series and the input terminal of said first inverter, and



capacitive means connected between the output terminal of an even-numbered inverter in said inverter series and the input terminal of said first inverter; and

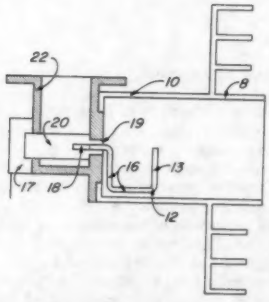
a constant current source means connected in series with the current path between the first and second biasing terminals of at least one of said inverters.

4,414,516

POLARIZED SIGNAL RECEIVER SYSTEM

H. Taylor Howard, San Andreas, Calif., assignor to Chaparral Communications, Inc., San Jose, Calif.

Filed Nov. 18, 1981, Ser. No. 322,446
Int. Cl.³ H01P 1//165
U.S. Cl. 333—21 A **15 Claims**



1. A polarized signal receiver comprising:

a first waveguide for transmitting polarized signals;

a circular waveguide for receiving polarized signals at one end and coupled to the first waveguide at the other end, said other end having a rear wall;

an insulator rod, rotatably mounted through said other end of the circular waveguide; and

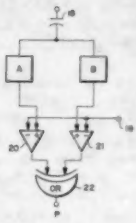
signal conducting means, fixedly mounted in the insulator rod concentric with the axis of rotation thereof having a receiver probe portion oriented in the circular waveguide orthogonal to the axis of said circular waveguide for receiving one polarization of the incident signal, a launch probe portion concentric with the insulator rod and extending into the first waveguide for launching said signal therein, and a transmission line portion, having a first section contoured to the inside surface of the circular wall, and substantially parallel to the axis, of the circular waveguide, and having a second section contoured to the inside surface, and substantially parallel to the plane, of the rear wall of the circular waveguide, for connecting the receiver probe portion to the launch probe portion.

4,414,517

NON-RINGING PHASE RESPONSIVE DETECTOR

Joseph Mahig, 701 SW. 91st St., Gainesville, Fla. 32601

Filed Jun. 12, 1981, Ser. No. 273,166
Int. Cl.³ H03H 7/01; H03K 5/26
U.S. Cl. 333—167 **10 Claims**



1. A non-ringing circuit for detecting the presence of a predetermined frequency component in an input signal and for delivering an output signal when said predetermined component is dominant, the detector comprising:

(a) multiple tuned filters each having an input terminal connected to receive said input signal and having an output terminal at which the frequency components appear, and each filter having a tuned frequency near said predetermined frequency, said tuned frequencies of the respective filters being different each from the other by increments of frequency.

(b) plural coincidence detector means coupled to selected paired filter output terminals, and said coincidence detector means being operative to deliver plural binary response signals indicating whether the dominant frequency components appearing at the respective filter output terminals are mutually in phase or out of phase; and

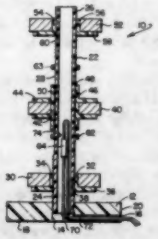
(c) gate means connected to receive said binary response signals, said gate means comprising a logic circuit responsive to the binary states of said response signals and operative to deliver said output signal when the predetermined frequency component dominates said input signal.

4,414,518

VERTICAL DESCENT RATE DETECTOR SWITCH

Aaron V. Farr, Logan, Utah, assignor to Abex Corporation, New York, N.Y.

Continuation of Ser. No. 197,395, Oct. 16, 1980. This application Nov. 30, 1982, Ser. No. 445,815
Int. Cl.³ H01H 9/00
U.S. Cl. 335—205 **1 Claim**



1. A vertical descent rate detector switch actuated when force of gravity acting thereon is less than 1.0 comprising:

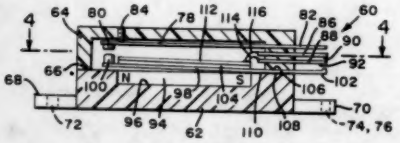
a non-magnetic means for guiding a magnet;
a first magnet mounted at one end of the guide means;
a movable second magnet;
a bore formed in the second magnet characterized by;
the guide means passing through the bore in the second magnet such that the second magnet is positioned above the first magnet; the first and second magnets positioned such that the lines of the magnetic field of the first magnet run opposite in direction to the lines of the magnetic field of the second magnet to cause the first and second magnets to repel each other and the second magnet is supported above the first magnet by the opposing magnetic fields such that the weight of the second magnet is cancelled;
first an second contacts positioned in the guide means between the first and second magnets;
the contacts being movable between a first position in which they are opened and a second position in which they are closed; the second magnet being movable between a first position in which the lines of the magnetic fields of the first and second magnets pass through the first and second contacts respectively such that the contacts have the same polarity and are opened and a second position in which the lines of the magnetic fields of one of the first and second magnets pass through the first and second contacts such that the contacts have opposite polarity and are closed; the second magnet is in one of the first or second positions when the switch is at rest and the gravity force acting on the switch and the first magnet is equal to 1.0; and the second magnet is in the other of the first or second positions when the rate of descent of the switch and the first magnet is equal to a gravity force of less than 1.0 and the relative distance between the first and second magnets is greater than when the switch is at rest.

4,414,519

TEMPERATURE-SENSITIVE RELAY

Philip M. Anderson, III, Chatham, and Ronald K. Reich, Phillipsburg, both of N.J., assignors to Allied Corporation, Morristown, N.J.

Filed Mar. 10, 1982, Ser. No. 356,874
Int. Cl.³ H01H *51/00*
U.S. Cl. 335—208 **12 Claims**



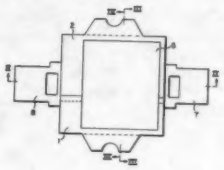
1. A temperature-sensitive relay adapted to be connected to circuit means having a power source for providing an electrical current and switching means for activating said circuit means in response to a preselected condition, said realy comprising:
base means for mounting said temperature-sensitive relay;
a resilient movable cantilever carrying a first contact member, said cantilever being a composite member having a first portion composed of conductive material and a second portion composed of amorphous ferromagnetic material having a Curie point;
a second contact member disposed adjacent said first contact member for at least intermittently establishing electrical contact with said first contact member;
said first contact member being connected to first terminal means;
said second contact member being connected to second terminal means;
gripping means for supporting the cantilever and electrically connecting it to said first terminal means;
support means for supporting said second terminal means;
magnet means associated with and adapted to bias said cantilever to a first position that interrupts electrical continuity between said first and second contact members, said cantilever being transformed from a ferromagnetic phase to a paramagnetic phase when its temperature exceeds the Curie point, whereby said cantilever assumes a second position in which said electrical continuity is established;
heating means connected to said circuit means and disposed in the vicinity of said cantilever to effect said transformation during a preselected time interval following activation of said circuit means; and
bias means for urging said cantilever to move said first contact member to said second position.

4,414,520

THERMOSTAT

Jonny Ruuth, Postlåda 9138, S-951 90 Luleå, Sweden

PCT No. PCT/SE81/00188, § 371 Date Mar. 1, 1982, § 102(e) Date Mar. 1, 1982, PCT Pub. No. WO82/00219, PCT Pub. Date Jan. 21, 1982
PCT Filed Jun. 26, 1981, Ser. No. 359,663
Claims priority, application Sweden, Jul. 4, 1980, 8004951
Int. Cl.³ H01H *61/013*
U.S. Cl. 335—208 **9 Claims**



1. A thermostat comprising:
a housing;
a heat sensitive body made of ferromagnetic material connected to said housing, said body losing magnetic attraction with a change in temperature;
magnet means having a magnet movably mounted to said housing from an attracted position toward said body to a spaced position away from said body, said magnet means including an outwardly extending lever element;
a fixed contact connected to said housing;
a movable contact mounted to said housing having a contact portion movable from a first position in contact with said fixed contact to a second position spaced from said fixed contact; and
biasing means connected between said movable contact and said lever element for biasing said magnet means into its spaced position and simultaneously biasing said movable contact into its second position, said biasing means connected for moving said movable contact into its second position with said magnet means in its spaced position, and for moving said movable contact into its first position with said magnet means in its attracted position.

4,414,521

LOW RELUCTANCE TRANSFORMER CORE

Daniel E. Reisem, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

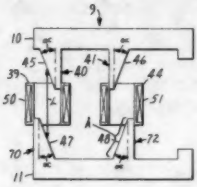
Continuation-in-part of Ser. No. 34,381, Apr. 30, 1979, Pat. No. 4,321,652. This application Mar. 23, 1981, Ser. No. 246,621
Int. Cl.³ H01F *3/00*
U.S. Cl. 335—281 **7 Claims**

1. A ferromagnetic core having a source of operating flux for establishing a magnetic field in said core, comprising:

a first member having first and second leg elements tapered in opposite directions; and

a second member having first and second leg elements tapered in opposite directions;

said tapered leg elements each having a continuous tapered interface, said continuous tapered interface of said first member being oriented opposite to said continuous tapered interface of said second member, said continuous tapered interfaces adapted to cooperatively mate with a wedging action;



said first and second leg elements of said first member and said second member having a coefficient of friction with respect to each other, said continuous tapered interfaces of said first and second leg elements of said first member and said second member forming a taper angle, the value of the tangent of said taper angle being not more than the value of said coefficient of friction;

whereby low reluctance first and second legs are formed.

4,414,522

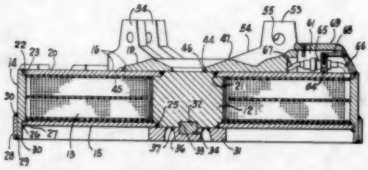
FABRICATED LIFTING MAGNET ASSEMBLY

James P. Rybak, Solon, Ohio, assignor to Magnetics International, Inc., Maple Heights, Ohio

Filed May 3, 1982, Ser. No. 374,496

Int. Cl.³ H01F 7/20

U.S. Cl. 335—291 **25 Claims**



1. A fabricated lifting magnet assembly comprising, in combination:

a permeable magnetic case having a permeable magnetic core;

electrical winding means surrounding said core;

outer wall means in said case at the periphery thereof;

support means underneath said winding means to support said winding means within said magnetic case; and

a composite magnetically permeable case top in said case connected in flux passing relationship with said outer wall means and said core;

said composite case top including a magnetically permeable cast member and magnetically permeable supplemental means of substantially uniform thickness;

means securing said cast member to said supplemental means for flux flow in each,

connector means for the dependent support of said lifting magnet assembly connected as an integral part of said cast member near the outer edges thereof,

and said cast member at locations near said core being of considerably greater thickness than at the outer edges thereof.

4,414,523

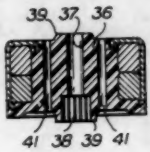
ENCAPSULATED MAGNET FOR MAGNETIC DRIVE

Ferdinandus A. Pieters, Walnut Creek, Calif., assignor to Micropump Corporation, Concord, Calif.

Filed Sep. 4, 1981, Ser. No. 299,865

Int. Cl.³ H01F 7/02

U.S. Cl. 335—302 **4 Claims**



1. An encapsulated rotatable magnet structure comprising an annular magnet having poles around its periphery and having an outer and an inner cylindrical surface and first and second substantially planar faces, the inner surface of said magnet being remote from the axis of rotation of said structure, a metallic jacket having a cylindrical portion positioned immediately outside said outer surface, said jacket having an in-turned flange on one edge of said cylindrical portion bearing against said first face and terminating in a short axially in-turned portion spaced inward of one edge of said inner cylindrical surface, said jacket having a slight inward bend on a second edge of said cylindrical portion crimped tightly against the corner where said second face and said outer cylindrical surface intersect and a central member having a hub formed with an axial bore formed to receive a shaft, said hub sealing against said inner surface and surrounding said in-turned portion, said central member having a flange sealing against said second face and surrounding said inward bend.

4,414,524

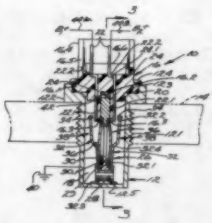
THERMALLY RESPONSIVE SWITCH

John Doherty, Jr., Assonet, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 7, 1981, Ser. No. 328,279

Int. Cl.³ H01H 61/00

U.S. Cl. 337—87 **11 Claims**



1. A thermally responsive switch having electrically insulating support means, first contact means mounted on the support means, second contact means movable between an open circuit position spaced from the first contact means and a closed circuit position engaged with the first contact means, spring means biasing the second contact means to one of said circuit positions, and thermally responsive means moving the second contact means to the other circuit position against said bias on the occurrence of selected temperature conditions, characterized in that the spring means is secured to a carrier means, the second contact means are secured to the spring means, and the thermally responsive means is disposed between the carrier means and the spring means for moving the spring and second contact means relative to the carrier means in response to temperature change, the carrier means being mounted in se-

lected location relative to the insulating support means so that the second contact means is moved from said one circuit position to the other circuit position as the second contact means moves relative to the carrier means in response to the occurrence of said selected temperature conditions.

4,414,525

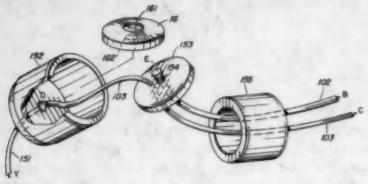
SWITCH WITH REPLACEABLE FLASHER UNIT

Ralph S. Garrabrants, 3674 W. Dahlia, Phoenix, Ariz. 85027

Filed Nov. 17, 1980, Ser. No. 207,283

Int. Cl.³ H01H *61/06*

U.S. Cl. 337—92 **6 Claims**



1. Means for adapting a conventional electrical circuit to provide a choice of continuous or intermittent operation comprising:

switch means adapted for mounting in a standard electrical interconnection box for selecting at least one of continuous and intermittent operation of an associated electrical circuit; and

cartridge means for retaining a replaceable, commercially available flasher unit in electrical interconnection with said switch means and an associated electrical circuit, said cartridge means including:

a base;

first means affixed to said base for receiving said flasher unit;

spring contact means disposed on said base within said first means for contacting a conductive contact on said flasher unit; and

a spring-loaded extension coupled directly to a contact on said switch means for contacting said flasher unit and for retaining said flasher unit within said first means.

4,414,526

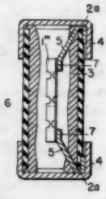
ELECTRIC FUSE HAVING COMPOSITE FUSIBLE ELEMENT

Robert J. Panaro, Byfield, Mass., assignor to Gould Inc., Rolling Meadows, Ill.

Continuation of Ser. No. 62,434, Jul. 30, 1979, abandoned. This application Nov. 16, 1981, Ser. No. 321,958

Int. Cl.³ H01H *85/60*

U.S. Cl. 337—163 **10 Claims**



1. In an electric low voltage fuse having a tubular casing of electric insulating material having a pair of rims, a pulverulent arc-quenching filler inside said casing, a fusible element having serially arranged perforations embedded in said arc-quenching filler, said fusible element having an overlay of an M-effect metal having a considerably lower fusing point than the remainder of said fusible element, a pair of terminals electrically connected to said fusible element and a pair of terminal caps mounted on the ends of said casing and enclosing said arc-quenching filler, said fusible element, and said pair of terminals within said casing, the improvement comprising:

(a) at least one of said pair of terminals including a tab of uniform thickness and cross-section made of a current-limiting metal extending from the inside of said casing across one of said pair of rims to the outside of said casing, said tab including a plurality of bends therein placing a significant portion of said tab in an abutting and electrically conductive relationship with one of said pair of terminal caps, said tab being electroconductively bonded to said fusible element;

(b) said fusible element being made of a relatively thin current-limiting sheet metal; and

(c) the ratio of the thickness of said tab to the thickness of said fusible element being between 2 and 5.

4,414,527

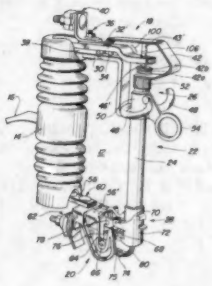
CONTACT ASSEMBLY FOR A FUSE CUTOUT

Bruce A. Biller, Chicago, Ill., assignor to S&C Electric Company, Chicago, Ill.

Continuation of Ser. No. 132,924, Mar. 24, 1980, abandoned. This application Oct. 26, 1981, Ser. No. 314,636

Int. Cl.³ H01H *85/22*

U.S. Cl. 337—180 **12 Claims**



1. In a cutout mounting having first and second contact assemblies between which a fuse tube of predetermined length is supportable, an improved second contact assembly of the type which includes:

(a) a generally J-shaped spring contact, the long leg of the J being attached to a rigid, recoil bar, a portion of the recoil bar extending into the space between the legs of the J, the short leg of which has a concavity formed therein for selectively receiving an end of the fuse tube and a convexity complementary with the concavity;

(b) a pin freely passing through a hole in the extending portion of the recoil bar and being attached between the long leg and the convexity, both legs being constrained to move together as the pin moves through the hole and the long leg flexes out of a rest location about its point of attachment to the recoil bar; and

(c) resilient means acting between the short leg and the recoil bar for setting the rest location of the long leg;

closure of the cutout by rotating the fuse tube in the first contact assembly inserting an end of the fuse tube into the concavity so that the legs are deflected against the action of the resilient means and the flexing of the long leg out of its rest location; operation of the cutout causing the fuse tube to thrust both against and transverse to the concavity, such thrust (i) applying a bending force to the fuse tube which may fracture as a result thereof, (ii) randomly transversely moving the short leg and the pin until the pin engages the walls of the hole, and (iii) further deflecting the legs against the action of the resilient means and the

flexing of the long leg; wherein the improvement comprises:

an offset formed in the recoil bar to position the extending portion and the hole substantially closer to the short leg and the convexity to

(1) limit the extent of the random transverse motion which the short leg can experience before the pin engages the hole walls, thereby limiting the bending force on the fuse tube, and

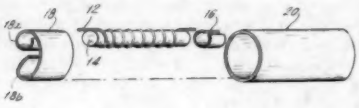
(2) accurately position the convexity sufficiently close to the recoil bar to accurately limit the amount of movement of the short leg before it engages the recoil bar, thereby earlier transferring force caused by such thrust to the recoil bar.

4,414,528

CRIMP FUSE

Elliot Bernstein, Rockville Centre, N.Y., assignor to Bel Fuse, Inc., Jersey City, N.J.

Filed Mar. 24, 1980, Ser. No. 133,331
Int. Cl.³ H01H *85/16*
U.S. Cl. 337—187 **5 Claims**



1. A crimp fuse comprising: a length of fuse wire material;

insulative rod means supporting said length of said fuse wire material;

first and second conductive sleeves crimped onto respective ends of said rod means in good electrical contact with said length of fuse wire material; and

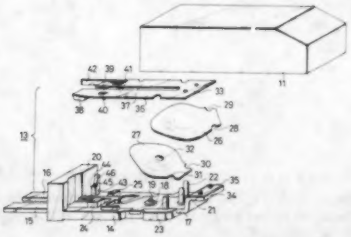
an insulative coating covering said length of fuse wire material, said first conductive sleeve including a portion shaped for receiving an electrical conductor to be connected thereto by crimping.

4,414,529

THERMAL SWITCH

Hideoki Yoshioka; Ichiro Okino, and Toshiaki Toda, all of Osaka, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Oct. 16, 1981, Ser. No. 311,944
Claims priority, application Japan, Dec. 10, 1980, 55-173977
Int. Cl.³ H01H *37/54*
U.S. Cl. 337—365 **11 Claims**



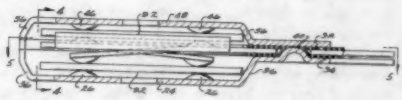
1. A thermal switch including a switch body comprising a base, a plurality of outer terminals held on said base to be electrically independent of each other and respectively having a fixed contact, a plurality of movable contact springs corresponding in number to said outer terminals and respectively having a movable contact contactable with each of said fixed contacts, respective said movable contact springs being electrically connected with each other, a movable-contact-spring fixing plate held onto the base for fixing said movable contact springs in mutually parallel relation in the horizontal direction, and a plurality of bimetals each having a set-temperature different from that of the other and operating respectively independently so as to separate the movable contact of one of the movable contact springs from the fixed contact, whereby one of the movable contact springs operated by one of said bimetals which has said set-temperature relatively lower than the other forms resetting-type switching contacts and the other of the springs of the set-temperature relatively higher forms non-resetting type switching contacts.

4,414,530

MINIATURE MOTOR PROTECTOR APPARATUS AND METHOD FOR ASSEMBLING THEREOF

Michael L. Bouffard, Smithfield, R.I., and Radi Pejouhy, Marshfield, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 22, 1981, Ser. No. 276,226
Int. Cl.³ H01C *7/02*
U.S. Cl. 338—25 **13 Claims**



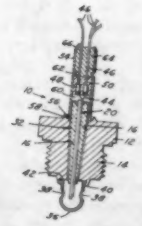
1. A motor protector particularly suitable for use with a low current, intermittent duty motor comprising a metallic housing having top and bottom wall surfaces, and having a terminal extending from one of the surfaces, the housing comprising a sheet having first and second portions with a first recess formed in the first portion and a second recess formed in the second portion, the first and second portions being integrally connected and hinged together, first and second PTC wafers, the first wafer in physical and electrical engagement with the top wall surface, the second wafer in physical and electrical engagement with the bottom wall surface, an electrically conductive center contact disposed between the first and second PTC wafers and in physical and electrical engagement therewith, the center contact having a terminal extending therefrom beyond the top and bottom wall surfaces of the housing and electrically insulative material placed between the center contact and the housing.

4,414,531

PARTIAL PRESSURE OF OXYGEN SENSOR-I

Robert F. Novak, Farmington Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Sep. 30, 1982, Ser. No. 429,414
Int. Cl.³ H01L *7/00*
U.S. Cl. 338—34 **3 Claims**



1. A partial pressure of oxygen sensor for insertion into an

exhaust system of a hydrocarbon fuel burning device, comprising in combination:

a mounting body formed of a metallic material threaded on one end for securement to the exhaust system and having a conical configured bore extending along a central axis thereof, said conical configured bore having its smaller end at said threaded end of said mounting body;

an elongated heated sensing element of generally rectangular cross section including: a ceramic support, a resistance heater element bonded to a leading portion of said ceramic support, a titania dioxide sensor element also bonded to said leading portion of said ceramic support so that said resistance heater heats said sensor element to a required temperature when a preselected voltage is applied across said resistance heater element, a plurality of electrically conductive paths bonded to said ceramic support, said paths for independently connecting said resistance heater element to a source of voltage and said titania dioxide sensor element to a sensing circuit;

a two-piece insulator body of ceramic material, each piece of said insulator body having a shape approximating a half-cone with the smaller cross section of said half-cone being at a leading portion of said two-piece insulator body, said two-piece insulator body sandwiching said heated sensing element therebetween with said leading portion of said heated sensing element projecting beyond said leading portion of said two-piece insulator body, said two-piece insulator body sandwiching said heated sensing element therebetween being received in said conical configured bore of said mounting body in a manner such that said leading portion of said heated sensing element projects beyond said threaded end of said mounting body;

a first protection tube means secured to said threaded end of said mounting body for protecting said leading portion of said heated sensing element, said first protection tube having an opening therein through which exhaust gases may flow into contact with said heated sensing element;

a plurality of fine electrical lead lines, one of said fine lead lines being bonded to and extending from each of said conductive paths bonded to said ceramic support;

a plurality of electrical lead lines equal in number to said fine electrical lead lines;

a plurality of crimped bands, each of said crimped bands interconnecting paired ones of said electrical lead lines and said fine electrical lead lines;

a second ceramic insulator body having a plurality of passageways therein equal in number to said plurality of crimped bands, said passageways being so constructed and arranged that each of said passageways has an associated pair of said interconnected leads passing therethrough with said clipped band interconnecting the same coming into locating engagement with the side walls defining said associated passageway;

a second protection tube means having one end secured to an end of said mounting body not having said threads thereon for enclosing and protecting said second ceramic insulator body and elements received therein and passing therethrough;

a ceramic cement occupying a volume between said second ceramic insulator body and a rear portion of said two-piece insulator body and heated sensing element sandwiched therebetween;

a high temperature resistant sealant material occupying a volume between said second ceramic insulator body and a free end of said second protection tube means; and

electrical terminal means connected to said plurality of electrical lead lines for independently connecting said lead lines as required to a source of voltage and to a sensing circuit.

4,414,532

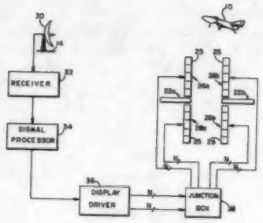
DISPLAY SYSTEM FOR AIRCRAFT LANDING GUIDANCE

Charles E. Kaul, 7101 Galgate Dr., Springfield, Va. 22152

Filed Nov. 17, 1981, Ser. No. 322,289

Int. Cl.³ G08G *5/00*; B64F *1/20*

U.S. Cl. 340—26 **9 Claims**



6. In an optical guidance system for remotely aiding a pilot in the landing of an aircraft along a desired glideslope, of the type wherein light sources located behind vertically-stacked Fresnel lenses situated between two horizontal light arrays produce a virtual image of light which moves vertically as seen by the pilot to provide glideslope displacement information, the improvement comprising:

a first pair of light arrays substantially parallel to each other and mounted above the horizontal light arrays on either side of the lenses, each of said first light arrays comprising a series of discrete light cells in a linear configuration;

a second pair of light arrays substantially parallel to each other and aligned with respective ones of said first light arrays, said second pair of light arrays being mounted below the horizontal arrays on either side of the lenses, each of said second light arrays comprising a series of discrete light cells in a linear configuration; and

drive means sensitive to amplitude and polarity of analog signals provided at its input and electrically coupled at its output to said first and second light arrays for continuously energizing said cells in succession in accordance with an analog input signal indicative of the magnitude and direction of instantaneous error in the appropriate descent rate of the aircraft relative to the glideslope.

4,414,533

CLUTCH RELEASE MECHANISMS

Brian Scott, Halifax, and Robert Duncan, Huddersfield, both of England, assignors to David Brown Tractors Limited, Huddersfield, England

Filed Jun. 11, 1981, Ser. No. 272,600

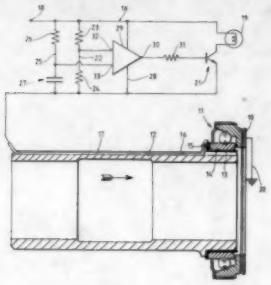
Claims priority, application United Kingdom, Jun. 14, 1980, 8019519

Int. Cl.³ B60Q *1/00*

U.S. Cl. 340—52 R **10 Claims**

1. Means for indicating take-up of the clearance between a release bearing of a friction clutch and a release plate thereof against which said bearing abuts whenever the clutch is re-

leased comprising an electrically-insulated mounting for the bearing, a power line connecting an electric supply to the



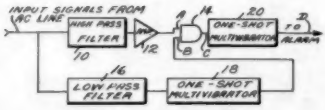
bearing, a warning device interposed in said line, and a return line connecting the release plate to the electric supply.

4,414,534

RADIO FREQUENCY DETECTION CIRCUITRY HAVING NOISE DISCRIMINATION CAPABILITY

Glenn H. Whidden, 13214 L'Enfant Dr., Fort Washington, Md. 20022

Filed Sep. 14, 1981, Ser. No. 302,116
Int. Cl.³ G08B *13/00*; H03K *9/06*; H04B *17/00*
U.S. Cl. 340—310 A **10 Claims**



1. A circuit arrangement for use in detecting the presence of radio frequency signal transmission on an electrical power line, comprising:

a filter operatively related to said line, said filter being adapted to pass radio frequency signals while rejecting signals of lower frequency;

means for applying signals passed by said filter to a first input of a gate;

means connected to said line and responsive to a zero crossing of a power supply voltage applied to the line for producing a gating signal of predetermined duration commencing at the occurrence of said zero crossing;

means for applying the gating signal to a second input of said gate; and

means responsive to an output signal from said gate, obtained upon coincidence of signals on said first and second gate inputs, for energizing an alarm actuator.

4,414,535

MAGNETIC RESONANCE GYRO SIGNAL PROCESSOR

Lincoln S. Ferriss, Lincoln Park, N.J., assignor to The Singer Company, Little Falls, N.J.

Continuation-in-part of Ser. No. 931,702, Aug. 7, 1978, abandoned. This application Apr. 28, 1980, Ser. No. 144,145
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 AD **1 Claim**

1. A signal processor operating on inherently analog signals for converting them to digital words representing gyro angle comprising:

a source of composite analog signals containing gyro angular displacement,

means for separating and frequency-multiplying said gyro analog signals retaining phase coherence,

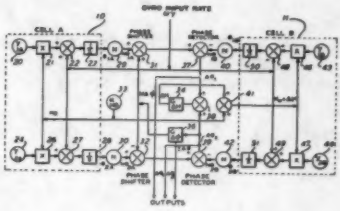
phase detector means for detecting and comparing said frequency multiplied signals and for producing a residual PDM signal,

means for incrementally phase shifting said frequency multiplied signals and accumulating the number of said increments such that subsequent phase comparisons remain within a fixed monotonic region of said phase detection means,

means for operating on said residual PDM signal producing a digital word representative of the duty cycle, and

means for scaling and adding said accumulated number of said increments produced by said phase shifting means to the result of said digital word thereby producing digital output words representing gyro angle,

wherein said means for incrementally phase shifting said signals comprises:



a shift register containing eight images of said gyro analog signals,

a multiplexer connected to said shift register for maintaining the phase shifted signal within a selected monotonic range,

an advancer-retarder detector connected to said multiplexer for developing an electronic window for retarding the analog signals which fall within said electronic window,

a gating circuit to maintain phase detection inputs within a monotonic range, and

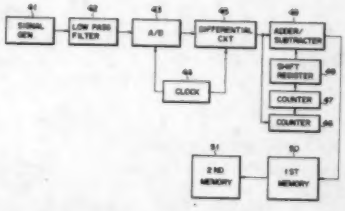
an up/down counter connected to said gating circuit and providing a three bit address to the input of said multiplexer.

4,414,536

DATA COMPRESSING SYSTEM

Masahiko Sumi, Chigasaki, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jul. 22, 1981, Ser. No. 285,802
Claims priority, application Japan, Jul. 25, 1980, 55-102258; Apr. 8, 1981, 56-52823
Int. Cl.³ H03K *13/00*
U.S. Cl. 340—347 DD **11 Claims**



1. A data compressing system comprising:

sampling means for sampling an input signal at a given sampling period to produce a plurality of sampled data trains, each of said data trains containing a given number of sampled data elements;

differential means connected to said sampling means for differentiating said sampled data elements to obtain a

plurality of differential data trains, each of said differential data trains containing a given number of differential data elements;

coding means connected to said differential means for applying code elements, each of the code elements including different weight codes, to the differential data elements of each of said differential data trains, said coding means including first counting means for counting said data elements of each of said differential data trains to generate carry data, second counting means for counting up in response to said carry data of said first counting means, and means for applying said weight codes corresponding to the contents of said counting means to said differential data trains; and

summing means connected to said coding means for summing said differential data trains with said weight codes to obtain compressed data.

4,414,537

DIGITAL DATA ENTRY GLOVE INTERFACE DEVICE

Gary J. Grimes, Thornton, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 15, 1981, Ser. No. 302,700
Int. Cl.³ G06F *3/02*
U.S. Cl. 340—365 R **19 Claims**

1. A man-machine interface for translating discrete character specifying positions of a hand into electrical signals representing said characters comprising:

flex sensors positioned with respect to said hand for detecting the flexing of associated digit joints,

contact sensors positioned with respect to the digits of said hand and adapted so that a selected pair of contact sensors contact each other as said hand assumes different character specifying positions,

additional sensors positioned with respect to the digits and metacarpus of said hand for detecting hand movements,

means including said flex sensors and said contact sensors and said additional sensors responsive as said hand assumes different character specifying positions for generating electrical signals representing each of said specified characters, and

means responsive to said electrical signals from said sensors as said hand assumes said different character specifying positions for applying output signals identifying each of said specified characters to a utilization device.

4,414,538

KEYBOARD SENSE GATE

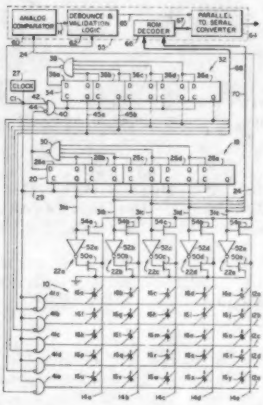
Paul G. Schnizlein, Des Plaines, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Dec. 7, 1981, Ser. No. 327,859
Int. Cl.³ G06F *3/02*
U.S. Cl. 340—365 S **5 Claims**

1. A circuit for scanning a plurality of keyswitches (**16***a–y*) arranged in a matrix having a plurality of row conductors (**12***a–e*) and a plurality of column conductors (**14***a–e*), each of said row conductors (**12***a–e*) being sequentially energized so that upon actuation of a keyswitch (**16***a–y*) connecting an energized row conductor, a signal is coupled to a corresponding one of the column conductors (**14***a–e*); a plurality of sense gates (**22***a–e*) each of which is associated with one of the column conductors (**14***a–e*), each of said column sense gates (**22***a–e*) comprising:

means (**50***a–e*) when placed in a dicharge mode for selectively discharging, in response to a first control signal, any signal present upon the associated column conductor (**14***a–e*);

means (**54***a–e*) when placed in a conductive mode for selectively coupling, in response to a second control signal, any signal upon the associated column conductor (**14***a–e*) to a sense conductor (**24**), said selective discharge means



(**50***a–e*) and said coupling means (**54***a–e*) being alternatively operative;

means (**18**) for sequentially supplying said second control signals to said column sense gates (**22***a–e*) so as to sequentially place said coupling means (**54***a–e*) of each of said sense gates (**22***a–e*) in the coupling mode and for placing the remaining sense gates (**22***a–*) in the discharge mode; and

a coding circuit (**60, 62, 64, 66**) responsive to signals identifying the matrix position of a keyswitch (**16***a–y*) location currently being scanned and to the signal upon said sense conductor (**24**) for generating a coded representation of the actuated keyswitch.

4,414,539

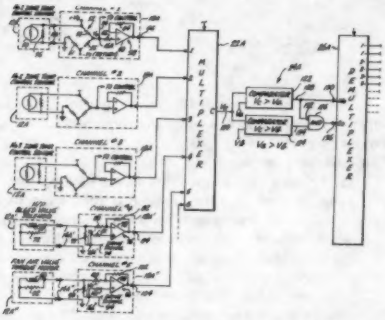
BUILT-IN PASSIVE FAULT DETECTION CIRCUITRY FOR AN AIRCRAFT'S ELECTRICAL/ELECTRONIC SYSTEMS

James P. Armer, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 22, 1978, Ser. No. 972,501
Int. Cl.³ G08B *23/00*
U.S. Cl. 340—500 **9 Claims**

1. In a built-in test apparatus for an aircraft's electrical/electronic system that has a plurality of LRUs each incorporating a nonswitching electrical LRU component, each of such LRU components havine an impedance within a predetermined range of finite, non-zero impedance values, and wherein the plurality of LRUs are mounted at diverse locations throughout the aircraft, and the electrical/electronic system has a plurality of electrical terminal means disposed at a central equipment bay and LRU-to-terminal interconnect wiring extending between said terminal means and associated LRUs for communicating non-test electrical control signals between individual terminal means and the associated LRU component, wherein the improvement in the built-in test apparatus comprises:

a plurality of passive test shunts each of which is permanently connected across an associated one of said plurality of LRU components so as to be physically part of the corresponding LRU and thus removable and replaceable as a unit with the associated LRU component, said test shunts each having an impedance selected to lie between a predetermined minimum and a predetermined maximum, said predetermined minimum impedance being substantially equal to or greater than the lowest impedance value of said predetermined range of values of the associated LRU component, and said predetermined maximum impedance being substantially less than a predetermined open wire impedance of the associated interconnect wiring so that an application of an associated one of said non-test electrical control signals to such associated LRU component over the interconnect wiring causes a first predetermined electrical condition at the associated terminal means when such LRU component and associated shunt



and associated interconnect wiring are in an unfailed state, and causes a second predetermined electrical condition when such LRU component is in a failed open state and the associated interconnect wiring is in an unfailed state, and causes a third predetermined electrical condition when the associated interconnect wiring is in a failed open state;

fault detector means for detecting and distinguishing between said first, second and third predetermined electrical conditions at each of said terminal means, said detector means having first, second and third discrete electrical states, respectively representing unfailed states of one of said components and of its associated shunt and interconnect wiring, a failed open state of one of said components, and a failed open state of the associated interconnect wiring; and

coupling means for coupling said plurality of terminal means to said fault detector means so as to detect said electrical conditions at each of said terminal means.

4,414,540

AUTOMATIC REDUNDANT TRANSDUCER SELECTOR FOR A STEAM TURBINE CONTROL SYSTEM

Royston J. Dickenson, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 6, 1981, Ser. No. 280,672

Int. Cl.³ G08B *21/00*

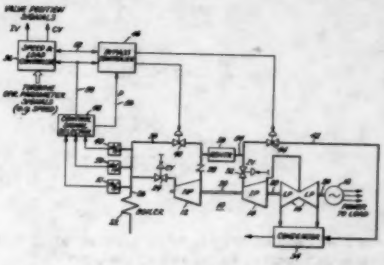
U.S. Cl. 340—508 **10 Claims**

1. In a control system for a steam turbine, an automatic signal selector for assuring selection of a valid signal representation of a controlled parameter, comprising:

a plurality of redundant sensing means, each providing a signal representation of a single controlled parameter and said plurality of sensing means providing redundant multiple signals of a single controlled parameter;

a plurality of range detection means, each detection means receiving a corresponding one of said controlled parameter signals and said detection means providing an alarm signal output whenever said corresponding controlled parameter signal is outside a preselected range of values; and

a selector network receiving each said controlled parameter signal and each said alarm signal, and said network selecting, exclusive of any controlled parameter signals that



may be outside said preselected range of values, an output signal which is the highest valued one of said controlled parameter signals whenever any one of said alarm signals is received or an intermediate valued one of said controlled parameter signals whenever none of said alarm signals is received, the controlled parameter signal thus selected being taken as a valid controlled parameter signal for turbine control.

4,414,541

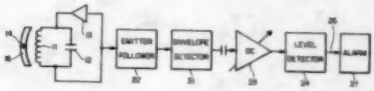
MOTION SENSING SYSTEM

Eugene Y. Ho, San Carlos, Calif., assignor to Techne Electronics Limited, Palo Alto, Calif.

Filed May 29, 1981, Ser. No. 268,569

Int. Cl.³ G08B *13/00*

U.S. Cl. 340—566 **7 Claims**



5. An apparatus for detecting motion of an object on which it is placed comprising:

an oscillator including a tuned circuit providing output oscillations,

motion responsive means in said apparatus coupled to said tuned circuit to move and modulate the amplitude of the oscillations responsive to motion of the object,

an envelope detector connected to said oscillator to receive the oscillations and provide an output signal whose amplitude is representative of the amplitude of the oscillations,

means for receiving said output signal and provide an alarm signal when the amplitude of said output signal falls outside a predetermined upper or lower level.

4,414,542

TWO CHANNEL COMPARISON-TYPE FIRE OR EXPLOSION DETECTING SYSTEM

Robert L. Farquhar, Woodley, and David N. Ball, Langley, both of England, assignors to Graviner Limited, England

Filed May 15, 1981, Ser. No. 265,016

Claims priority, application United Kingdom, May 17, 1980, 8016385

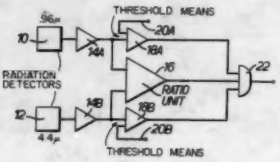
Int. Cl.³ G08B *17/12*

U.S. Cl. 340—578 **6 Claims**

1. A system for detecting fires or explosions emitting radia-

tion having a characteristic wavelength and also emitting radiation at other wavelengths, comprising

first radiation sensing means to sense radiation in a narrow wavelength band including the characteristic wavelength and to produce a first electrical output dependent on the intensity of the radiation sensed but delayed with respect thereto,



second radiation sensing means to sense radiation in a wavelength band including one of the other said wavelengths and producing a second electrical output relatively instantaneously dependent on the intensity of the radiation sensed,

means measuring the ratio of the two electrical outputs, and

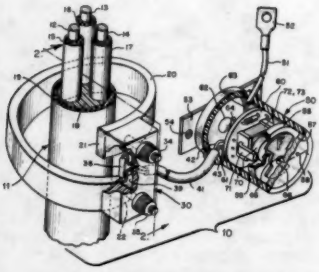
output means producing a fire or explosion indicating output only when the ratio of the first electrical output to the second electrical output exceeds a predetermined value.

4,414,543

GROUND FAULT INDICATOR

Edmund O. Schweitzer, Jr., 1002 Dundee Rd., Northbrook, Ill. 60118

Filed Sep. 25, 1980, Ser. No. 190,498
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—651 **15 Claims**



1. A ground fault indicator for indicating the occurrence of a ground fault current in multi-conductor electrical mains, comprising, in combination:

magnetic circuit means comprising a helical magnetic pole piece having axially displaced ends encircling the conductors of the mains and forming a magnetic field between said axially displaced ends substantially parallel to the axis of said conductors dependent on the vector sum of the individual currents in the conductors;

magnetic sensing means disposed between said axially displaced ends and producing a control effect in response to said magnetic field exceeding a predetermined threshold level;

status indicating means having a reset-indicating state and a fault-indicating state; and

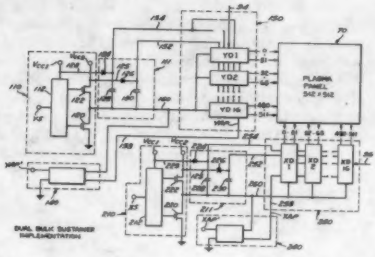
circuit means for conditioning said status indicating means to said fault-indicating state in response to said control effect.

4,414,544

CONSTANT DATA RATE BRIGHTNESS CONTROL FOR AN AC PLASMA PANEL

Joseph T. Suste, Orange, Calif., assignor to Interstate Electronics Corp., Anaheim, Calif.

Filed Jun. 12, 1981, Ser. No. 273,095
Int. Cl.³ G09G *3/28*
U.S. Cl. 340—767 **18 Claims**



1. A brightness control for an AC plasma panel having an inherent memory and having sustainer and driver circuitry, comprising:

means for generating:

(a) a first group of pulse trains controlling said sustainer and driver circuitry, said pulse trains executing sustain, write, and erase functions on said plasma panel with the emission of a first light level from said panel; and

(b) a second group of pulse trains controlling said sustainer and driver circuitry, said pulse trains executing sustain, write, and erase functions on said plasma panel with the emission of a second light level from said panel;

(c) wherein both said write functions set said inherent memory and both said erase functions unset said inherent memory; and

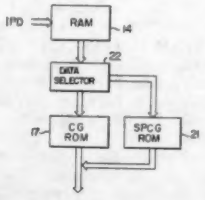
brightness selection means connected to said generating means and producing a signal which causes said generating means to selectively, alternatively output said first and second groups of pulse trains.

4,414,545

MEMORY CIRCUIT FOR GENERATING LIQUID CRYSTAL DISPLAY CHARACTERS

Hiroshi Sakurada, and Naofumi Aoyama, both of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 9, 1981, Ser. No. 329,047
Claims priority, application Japan, Dec. 17, 1980, 55-177271
Int. Cl.³ G09G *3/36*
U.S. Cl. 340—790 **2 Claims**



1. A liquid crystal display character generator circuit comprising:

a first RAM for temporarily storing information to be displayed on a liquid crystal display unit;

a ROM for storing in its respective addresses standard char-

acter patterns corresponding to information to be displayed and producing, when one of the addresses is designated, a signal representative of a character pattern stored in the designated address;

a second RAM capable of being dedicated for storing in at least one of its addresses at least one special character pattern corresponding to information to be displayed and operable to produce, when the address is designated, a signal representative of the character pattern stored in the designated address; and

a data selector for selecting one of the ROM and the second RAM in accordance with contents of the information stored in the first RAM and enabling the designation of the address in the selected one of the ROM and the second RAM in accordance with the information stored in the first RAM, ROM, second RAM and data selector being integrated in a one chip integrated circuit.

4,414,546

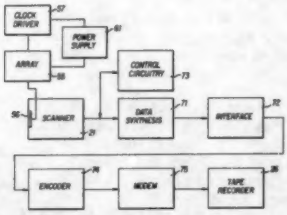
APPARATUS FOR AND METHODS OF IDENTIFYING HORSES BY SCANNING THEIR CHESTNUTS

Verner L. Taylor; Joseph B. Sprowls, III, both of Broomfield, and James R. Ayer, Louisville, all of Colo., assignors to Robert G. Boorman, Billings, Mont.

Filed Oct. 16, 1979, Ser. No. 85,384

Int. Cl.³ H04Q *9/00*; G06K *9/00*

U.S. Cl. 340—825.3 **12 Claims**



1. A method of utilizing a data processing system to authenticate the identity of a horse by generating a digital code number which is related to physical characteristics distinguishing that horse from all other horses, the method comprising the steps of:

(a) storing in the system an assigned number particular to the horse,

(b) optically scanning each of the horse's chestnuts in sequence to produce an electrical output indicative of characteristics corresponding to the configuration of the chestnuts,

(c) converting the output of each scan into a digital signal relating to the dimensional parameters of the chestnut,

(d) combining the outputs from each converting step with a serial number of the system and said assigned number to produce a digital code number, and

(e) recording the digital code number on a magnetic medium.

4,414,547

STORAGE LOGIC ARRAY HAVING TWO CONDUCTOR DATA COLUMN

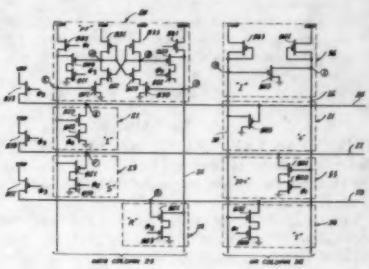
William Knapp, Chandler; William Dunn, Scottsdale, both of Ariz., and Kent F. Smith, Salt Lake City, Utah, assignors to General Instrument Corporation, New York, N.Y.

Filed Oct. 16, 1981, Ser. No. 312,188

Claims priority, application United Kingdom, Aug. 5, 1981, 8123966

Int. Cl.³ H04Q *9/00*; H03K *19/177*

U.S. Cl. 340—825.83 **44 Claims**



1. An integrated circuit storage logic array comprising:

at least one data column having first and second data column conductors;

a plurality of rows disposed substantially orthogonal to said column, each row comprising a row conductor;

clock means for generating a plurality of phase-displaced clock signals;

a storage cell operatively associated with said data column, said storage cell having a memory element, output means responsive to said clock means for transferring data from said memory element to said first and second data column conductors, and input means coupled for transferring data from said first and second data column conductors to said memory element; and

a plurality of functionally distinct logic cells connected between selected column and row conductors and adapted to be actuated by said clock means to manipulate data among said selected column and row conductors.

4,414,548

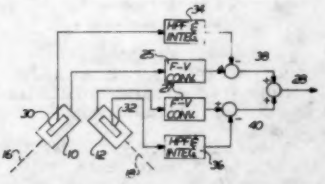
DOPPLER SPEED SENSING APPARATUS

Daniel D. Carpenter, Manhattan Beach, and Ronald L. Lanning, Rancho Palos Verdes, both of Calif., assignors to TRW Inc., Cleveland, Ohio

Filed Mar. 30, 1981, Ser. No. 249,073

Int. Cl.³ G01S *9/44*

U.S. Cl. 343—8 **15 Claims**



4. In a speed sensing system wherein first and second doppler velocity sensors are used to determine the velocity of a vehicle by each providing a doppler output signal indicative of movement of the vehicle relative to the ground along its respective boresight, which doppler output signals are combined

to form the velocity indication signal, the improvement comprising:

first and second accelerometer means for sensing accelerations of said vehicle along the boresight of said first and said second doppler velocity sensor respectively, each accelerometer means being insensitive to accelerations perpendicular to its respective boresight and thus providing an accelerometer output signal indicative of only the accelerations along said boresight,

processing means for processing said accelerometer output signals to derive at least one velocity error signal indicative of vehicle velocity components other than a velocity component of interest, and

first means for combining said doppler output signals and said at least one velocity error signal to derive a corrected velocity indication signal representative of said velocity component of interest.

4,414,549

METHOD AND APPARATUS FOR SENSING A TARGET

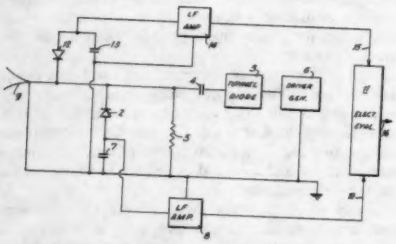
Günter Wichmann, Heidelberg, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 721,136, Apr. 10, 1968, abandoned. This application Mar. 31, 1971, Ser. No. 130,024

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1967, 1591117

Int. Cl.³ G01S *7/36*; F42C *13/04*

U.S. Cl. 343—18 E **13 Claims**



1. Apparatus sensitive to an object which has relative movement with respect to at least part of said apparatus; said apparatus comprising an antenna for transmitting radiation towards said object and receiving reflected radiation from the object, transmision impulse generating means coupled to said antenna to initiate the transmission of radiation from the latter, receiving means coupled to said antenna to receive signals therefrom and further coupled to said generating means to be actuated by the latter, and further means coupled to said receiving means and generating a signal based upon the movement of said object relative to said antenna; said further means including two means for generating low-frequency images of signals received by the antenna and means for algebraically mixing the images to cancel out jamming signals.

4,414,550

LOW PROFILE CIRCULAR ARRAY ANTENNA AND MICROSTRIP ELEMENTS THEREFOR

Carl P. Tresselt, Towson, Md., assignor to The Bendix Corporation, Southfield, Mich.

Filed Aug. 4, 1981, Ser. No. 289,851

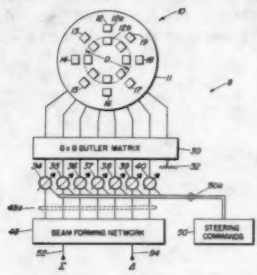
Int. Cl.³ H01Q *3/30, 9/28*

U.S. Cl. 343—700 MS **12 Claims**

1. A low profile circular array antenna resonant at a design frequency comprising:

a ground plane conductor;

a plurality of N antenna elements, each comprised of at least two patch dipoles, each said dipole being comprised of a flat rectangular conductive plate arranged parallel to said ground plane conductor and spaced a predetermined distance which is less than a quarter wavelength of said design frequency above said ground plane conductor and electrically shunted along at least one edge of said plate to said ground plane, the dipoles comprising an antenna element being arranged on a radial line from a common center on said ground plane conductor, there being N equally spaced radial lines from said common center, one said line for each said antenna element, each said plate having a feedpoint, the feedpoints on the dipoles comprising an antenna element being separated along said line a predetermined distance equivalent to a phase shift of said design frequency;



a plurality of N isolated power splitter means, one for each antenna element, having at least first, second and third ports, the power at said first port being split to said second and third ports, and including means for electrically isolating said second and third ports and additionally including first means for connecting said second port to the feedpoint of one of said dipoles of the associated antenna element and second means for connecting said third port to the feedpoint of the other of said dipoles of the same associated antenna element, each said power splitter means including means for shifting the phase of a signal of said design frequency at the feedpoint of said one dipole with respect to the signal of said design frequency at the feedpoint of said other of said dipoles by a phase angle equivalent to said predetermined distance.

4,414,551

POWER ANTENNA CONTROL CIRCUIT USED IN VEHICLE

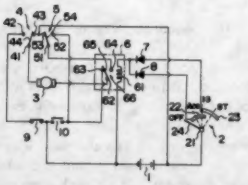
Kazuhiro Tadauchi, Toyota, and Taketsugu Torii, Kasugai, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jul. 6, 1981, Ser. No. 280,214

Claims priority, application Japan, Jul. 7, 1980, 55-95395[U]

Int. Cl.³ H01Q *1/32*

U.S. Cl. 343—903 **5 Claims**



1. A power antenna control circuit, comprising:

a reversible motor rotatable to raise or to lower an antenna;

a motor having at least two terminals;

a power source for said motor having at least two poles;

a first switching means which normally connects a first terminal of said motor to a first pole of said power source, said switching means being switchable to connect the first terminal of said motor to a second pole of said power source to raise said antenna;

a second switching means which normally connects a second terminal of said motor to the first pole of said power source, said second switching means being switchable to connect the second terminal of said motor to the second pole of said power source to lower said antenna;

a first limit switch between said first switching means and the second pole of said power source which is in the off position when the antenna is fully raised and in the on position when the antenna is at all other positions;

a second limit switch between said second switching means and the second pole of said power source which is turned off when the antenna is completely lowered and is turned on when said antenna is at all other positions;

a first transistor which is turned on when an ignition switch is turned on and which is turned off when the ignition switch is turned on;

a second transistor, the base of which is connected to the collector of said first transistor and the emitter of which is connected to the second limit switch for lowering the antenna, adapted to be turned on when said first transistor is turned off and turned off when said first transistor is turned on;

a relay coil connected at one end to said first pole of said power source and at the other end to said second pole of said power source through the collector and the emitter of said second transistor and said second limit switch; and

a relay switch which normally connects said second switching means for lowering said antenna to the second terminal of said motor and, when energized by said relay coil, connects the second terminal of said motor to the second pole of said power source by bypassing said second switching means for lowering the antenna.

4,414,552

PRINTING HEAD FOR INK JET PRINTERS

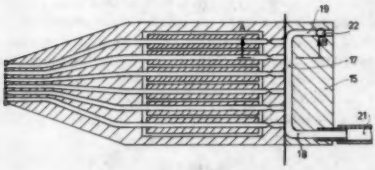
Udo Bergmann, Schwarzenbek; Heinrich Kurz, Pinneberg, and Wolfgang Radtke, Scharbeutz, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 3, 1982, Ser. No. 345,276

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1981, 3104077

Int. Cl.³ G01D *9/00, 15/16*

U.S. Cl. 346—1.1 **10 Claims**



8. A method of manufacturing a printing head for ink jet printers, comprising a plurality of tubular nozzle ducts, each of which has associated with it a drive member for the droplet-wise ejection of ink droplets at appropriate instants, the ink being applied thereto via a common distribution duct and individually associated damping members, each nozzle duct with its drive member forming a separate, operational droplet generator, the droplet generators being accommodated in a first block and the common distribution duct being accommodated in a second block, said blocks being preferably made of a plastic material, and being interconnected, comprising the steps of:

obtaining the predetermined shape for each nozzle duct (1) and providing it with a drive member (2);

testing each nozzle duct for suitable operation and droplet emission;

aligning each nozzle duct in a mount (12) and encapsulating it in a first plastic block (10); cutting the first plastic block (10) at its rear to be perpendicular to the ends of the nozzle ducts (1); and connecting it to the distribution duct (17) which is encapsulated in a second plastic block (15).

4,414,553

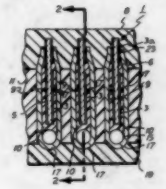
INK JET ARRAY

Theodore P. Perna, Garland, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 31, 1982, Ser. No. 364,064

Int. Cl.³ G01D *15/18, 9/00*

U.S. Cl. 346—1.1 **1 Claim**



1. A method of forming a fluid jet array, which comprises:

(a) producing at least two individual jets, each said jet comprising a substantially rectangular transducer and a channel for containing fluid, said transducer being positioned in operating relationship to said channel, and wherein each said transducer and said channel are at least partially enclosed in a rigid casing;

(b) testing each said jet to determine its acceptability as a droplet ejector; and

(c) assembling the acceptable jets into an array.

4,414,554

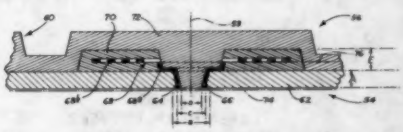
MAGNETIC IMAGING APPARATUS

Gilbert D. Springer, Sunnyvale, Calif., assignor to Ferix Corporation, Sunnyvale, Calif.

Filed Jul. 21, 1980, Ser. No. 170,788

Int. Cl.³ G01D *15/12*

U.S. Cl. 346—74.5 **10 Claims**



10. Thin-film, pancake-sandwich-like, electro-magnetic imaging structure comprising

a flexible, thin-film magnetic web having an aperture opening to opposite faces of the web,

a thin-film blanket of magnetic material including one portion spaced from said aperture in magnetic-circuit contact with, and distributed adjacent, one face of said web, and another portion extending in a magnetically gapped manner through said aperture with a facial expanse which is substantially flush with the other face of said web, and

spiral coil means spaced from said aperture, and sandwiched between and encompassed by said web and blanket adjacent the web's said one face in a manner capable, when energized, of inducing magnetic flux in the web and blan-

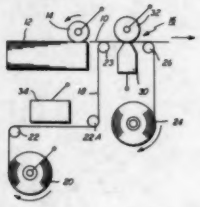
ket to produce on said web's said other face, in the region of said aperture, opposite-polarity magnetic poles.

4,414,555

METHOD AND APPARATUS FOR REPLENISHING MARKING MATERIAL TO A DONOR RIBBON IN A THERMAL MARKING PRINTER SYSTEM

Horace W. Becker, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 7, 1982, Ser. No. 375,772
Int. Cl.³ G01D *15/10*
U.S. Cl. 346—76 PH **1 Claim**



1. Apparatus for applying an ink coating to depleted areas of a ribbon used in a thermal transfer operation, the apparatus comprising:

an ink transfer ribbon connected between two feed rollers,

means for advancing, during a print cycle, the ink-coated ribbon through a thermal printing station in a first direction, said ribbon being wound around a first feed roller acting as a take-up roller,

an ink applicator positioned adjacent the ribbon path, said applicator out of contact with said ribbon during said print cycle,

means for periodically reversing the direction of said ribbon during a non-print cycle so that the ribbon is rewound on said second roller,

means for causing said ink applicator to come into contact with the ink-depleted ribbon surface during a time coincident with said reversed ribbon travel, whereby a uniform ink coating is applied to said surface, and

means for reactuating said ribbon advancing means coincident with initiation of the next print cycle.

4,414,556

LASER BEAM PRINTER

Mitsuo Ohno, Hadano, and Kikuo Hatazawa, Atsugi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 17, 1981, Ser. No. 303,135
Claims priority, application Japan, Sep. 18, 1980, 55-128548
Int. Cl.³ G01D *15/14*
U.S. Cl. 346—160 **3 Claims**

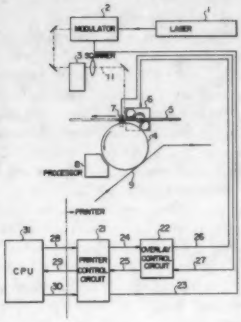
1. A laser beam printer for forming a latent image on a photosensitive body by a laser beam modulated in accordance with print information, comprising:

means for generating a laser beam modulated in accordance with print information;

a photosensitive body irradiated with said laser beam for forming a latent image on a surface of said photosensitive body;

scanning means for line-scanning said photosensitive body by said laser beam; and

a film having format information recorded thereon, said film being arranged between said scanning means and said



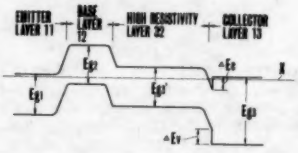
photosensitive body whereby said print information is superposed on said format information.

4,414,557

BIPOLAR TRANSISTORS

Yoshihito Amemiya, Fuchu; Tsuneo Urisu, Tokorozawa, and Yoshihiko Mizushima, Fuch, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Mar. 3, 1981, Ser. No. 240,148
Claims priority, application Japan, Mar. 10, 1980, 55-30096
Int. Cl.³ H01L *29/161, 29/80, 45/00, 29/72*
U.S. Cl. 357—16 **10 Claims**



1. In a bipolar transistor of the type comprising an emitter region, a base region and a collector region, the improvement wherein said collector region has a larger forbidden band gap than that of said base region and is made of material having different conductivity type from that of said base region and further comprising a high resistivity semiconductor region interposed between said base region said collector region, said high resistivity semiconductor region having the same conductivity type as said collector region, a lower impurity concentration than said collector region and the same forbidden band gap as that of said base region.

4,414,558

HETERO-JUNCTION LIGHT-EMITTING DIODE

Jun-ichi Nishizawa, Sendai, and Toru Teshima, Yokohama, both of Japan, assignors to Zaidan Hojin Handotai Kenkyu Shinkokai, Sendai and Stanley Electric Co., Ltd., Tokyo, both of, Japan

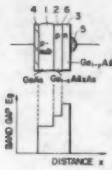
Filed Feb. 9, 1981, Ser. No. 232,967
Claims priority, application Japan, Feb. 7, 1980, 55-14504; Feb. 7, 1980, 55-14505; Feb. 7, 1980, 55-14506; Feb. 7, 1980, 55-14507; Feb. 7, 1980, 55-14508
Int. Cl.³ H01L *33/00, 29/161;* **H01S** *33/19*
U.S. Cl. 357—17 **7 Claims**

1. A hetero-junction light emitting diode for emitting light through a predetermined surface thereof comprising:

a p-type GaAs substrate having a first carrier concentration p_1;

a relatively low band-gap p-type semiconductor region disposed on said substrate, said p-type region being composed of $Ga_{1-x}Al_xAs$ ($0.3<x<0.37$), and having a second carrier concentration p_2, where: $p_2<p_1$, and $4.5\times10^{17}\,cm^{-3}<p_2<2.5\times10^{18}\,cm^{-3}$; and

a relatively high band-gap n-type semiconductor region disposed on said p-type region adjacent to said predetermined diode surface, said n-type region being composed



of $Ga_{1-y}Al_yAs$ ($y>x$), and having a carrier concentration n, where n is less than the carrier concentration p_2 of said p-type region, and $2\times10^{17}\,cm^{-3}<n<1\times10^{18}\,cm^{-3}$, said n-type region forming a pn hetero-junction with said p-type region having a face generally parallel to said diode predetermined surface;

said substrate, and n-type and p-type regions being disposed such that light rays derived in said diode are in a direction perpendicular to said face of said hetero-junction for emission through said predetermined surface.

4,414,559

SEMICONDUCTOR THYRISTOR DEVICE WITH LATERALLY DISPLACED AUXILIARY AND MAIN CATHODE REGIONS

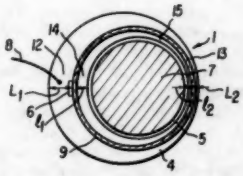
Yukio Igarashi, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 25,652, Mar. 30, 1979, abandoned. This application Apr. 17, 1981, Ser. No. 255,167

Claims priority, application Japan, Mar. 31, 1978, 53-37758

Int. Cl.³ H01L *29/74*

U.S. Cl. 357—38 **16 Claims**



1. A semiconductor device comprising:

a semiconductor body having first and second opposing principal surfaces including an anode layer of a first conductivity type having a surface exposed to said first principal surface, a first base layer of a second conductivity type superposed on said anode layer and forming a PN junction therewith, and a second base layer of said first conductivity type superposed on said first base layer and forming a PN junction therewith, said second base layer including a portion of its surface exposed to said second principal surface;

a cathode layer of said second conductivity type formed in said second base layer, a portion of the surface of said cathode layer being exposed to said second principal surface;

an auxiliary region of said second conductivity type formed in said second base layer, said auxiliary region being separated from said cathode layer, said auxiliary region having a portion of its surface exposed to said second principal surface;

a cathode electrode in contact with a portion of the surface of said cathode layer;

an anode electrode in contact with the surface of said anode layer;

an auxiliary electrode in contact with a portion of the surface of said auxiliary region and in contact with a portion of the surface of said second base layer, said auxiliary electrode substantially surrounding said cathode layer and said cathode electrode and being spaced apart therefrom; and

a gate electrode in contact with the surface of said second base layer, said gate electrode located external to said auxiliary electrode, said auxiliary region laying between said gate electrode and said cathode electrode;

wherein said semiconductor device includes a peripheral zone, said peripheral zone being the area of said second principal surface lying between said auxiliary electrode and an outer edge of said second base layer, said peripheral zone including a gate peripheral portion in the vicinity of said auxiliary region and said gate electrode, said gate peripheral portion having a greater width than any of the remaining portions of said peripheral zone; and

wherein said semiconductor device further includes a corridor zone, said corridor zone being the area of said second principal surface lying between said auxiliary electrode and said cathode electrode, said corridor zone including a gate corridor portion in the vicinity of said auxiliary region, said gate corridor portion having a greater width than any of the remaining portions of said corridor zone.

4,414,560

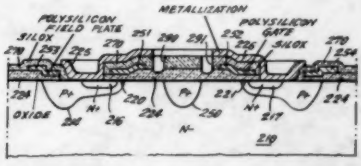
FLOATING GUARD REGION AND PROCESS OF MANUFACTURE FOR SEMICONDUCTOR REVERSE CONDUCTING SWITCHING DEVICE USING SPACED MOS TRANSISTORS HAVING A COMMON DRAIN REGION

Alexander Lidow, Manhattan Beach, Calif., assignor to International Rectifier Corporation, Los Angeles, Calif.

Filed Nov. 17, 1980, Ser. No. 207,126

Int. Cl.³ H01L *29/747*

U.S. Cl. 357—39 **5 Claims**



1. A metal oxide semiconductor type device for switching high voltage and high current circuits; said device comprising a body of semiconductor material of one conductivity type extending to a given depth and having a planar surface; first, second and third spaced regions of the other conductivity type formed in said body and terminating on said planar surface and having depths less than said given depth; said second region disposed between said first and third regions; fourth and fifth regions of said one conductivity type formed within said first and third regions respectively and extending to said planar surface; said first and fourth regions and said third and fifth regions defining respective first and second elongated laterial conduction channels; first and second gate electrodes insulated from and disposed above said first and second conduction channels and operable to invert said conduction channels to

control their conductivity; said second region defining a floating guard region.

4,414,561

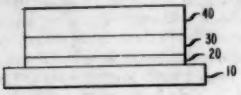
BERYLLIUM-GOLD OHMIC CONTACT TO A SEMICONDUCTOR DEVICE

Vassilis G. Keramidas, Warren; Robert J. McCoy, Chatham, and Henryk Temkin, New Providence, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 79,451, Sep. 27, 1979, Pat. No. 4,366,186. This application Sep. 7, 1982, Ser. No. 415,664

Int. Cl.³ H01L *23/48, 29/46, 29/62*

U.S. Cl. 357—67 **2 Claims**



1. A semiconductor device comprising a layer of p-type semiconductor material, said semiconductor being selected from the group consisting of InP and InGaAsP, and an ohmic contact to said semiconductor characterized in that said ohmic contact comprises:

a layer of beryllium-gold; and

a layer of gold.

4,414,562

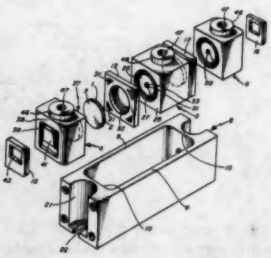
SEMICONDUCTOR HEAT SINK ASSEMBLY INCLUDING THERMALLY RESPONSIVE MEANS FOR INCREASING COMPRESSION AS THE TEMPERATURE OF SAID ASSEMBLY INCREASES

Richard F. Kiley, Stoneham, and Ralph I. Larson, Brookline, both of Mass., assignors to Thermal Associates, Inc., Stoneham, Mass.

Continuation of Ser. No. 171,827, Jul. 24, 1980, abandoned, which is a continuation-in-part of Ser. No. 142,862, Apr. 21, 1980, abandoned. This application Aug. 25, 1982, Ser. No. 411,299

Int. Cl.³ H01L *23/02, 23/42*

U.S. Cl. 357—81 **9 Claims**



1. A semiconductor assembly for facilitating electrical connection and double-side cooling of said semiconductor, comprising:

a semiconductor element having opposing sides;

two electrically and thermally conductive members having facing spaced surfaces;

means on said surfaces for receiving and electrically and thermally contacting said opposing sides of said semiconductor element positioned between said members;

compression means for maintaining said members and said semiconductor element under compression, with said surfaces in electrical and thermal contact with said semiconductor element, said compression means comprising a thermally conductive rigid retaining frame at least partially surrounding said members and said semiconductor element, and further comprising a thermally responsive element for increasing said compression as the temperature of the assembly increases; and

bonding means for fixing said members in position within said frame, said members being electrically isolated from and thermally coupled to said retaining frame by said bonding means.

4,414,563

TELEVISION RECEIVER CIRCUIT ARRANGEMENT FOR IDENTIFYING THE STANDARD

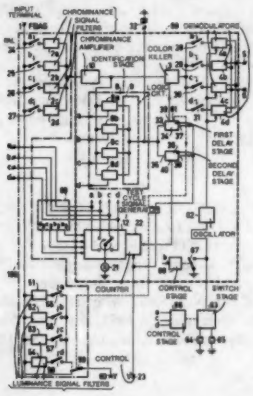
Klaus Juhnke, Rellingen, and Hartmut S. Harlos, Norderstedt, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 17, 1981, Ser. No. 322,122

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1980, 3043573; Sep. 21, 1981, 3137447

Int. Cl.³ H04N *9/32*

U.S. Cl. 358—21 R **35 Claims**



1. A circuit arrangement in a television receiver in which to identify the standard, the received colour television signal is applied to an identification circuit and the receiving channel is adjusted and/or switched over as regards its passband curve and demodulating circuit in accordance with the standard at which the received signal can be demodulated and reproduced, said circuit comprising:

an identification circuit, a chrominance signal demodulator circuit, and a test signal generator, said identification circuit in response to a standard test cycle actuating signal received from said test signal generator is sequentially switched to each of the available television standards, as long as the standard of a received colour television signal has not been identified, said test cycle actuating signal is maintained in its condition and said test signal generator is not switched a further step when the standard of the received colour television signal has been identified.

4,414,564

NONLINEAR EDGE PEAKING SYSTEM AND METHOD

James E. Hitchcock, Knoxville, Tenn., assignor to Magnavox Consumer Electronics Company, New York, N.Y.

Filed Dec. 28, 1981, Ser. No. 335,088

Int. Cl.³ H04N *5/14*

U.S. Cl. 358—37 **12 Claims**

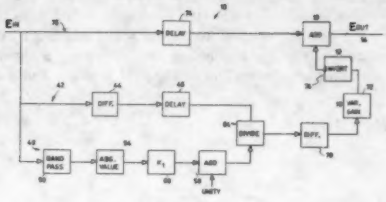
1. A nonlinear edge peaking system for decreasing the rise and fall times of input signal transitions while maintaining a

substantially similar frequency response and attenuating the introduction of excessive preshoot and/or overshoot, said system including:

first circuit means for delaying said input signal;

second circuit means connected in parallel with said first circuit means including means for taking the widened second derivative of said input signal and means for taking the absolute value of said second derivative of said input signal and for adding a preselected bias to said input signal, whereby the output of said second circuit means is the approximate absolute value of the widened second derivative of said input signal having a preselected bias;

third circuit means connected in parallel with said first circuit means and said second circuit means including means



for taking the first derivative of said input signal and for delaying said input signal such that the outputs of said second circuit means and said first circuit means are time coincident, whereby the output of said third circuit means is the delayed first derivative of the input signal;

fourth circuit means including means for combining said output of said second circuit means and said output of said third circuit means in a preselected manner and means for modifying said signal produced by combining said output of said second circuit means and said third circuit means to produce a correction signal, and means for adding said correction signal to the delayed input signal produced by said first circuit means to produce an overall waveform modified to contain reduced rise and fall times at the signal transitions with attenuated preshoot and overshoot.

4,414,565

METHOD AND APPARATUS FOR PRODUCING THREE DIMENSIONAL DISPLAYS

Ian A. Shanks, Malvern, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

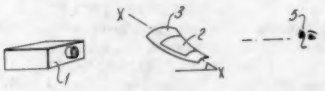
PCT No. PCT/GB80/00167, § 371 Date Jun. 11, 1981, § 102(e) Date Jun. 11, 1981, PCT Pub. No. WO81/01201, PCT Pub. Date Apr. 30, 1981

PCT Filed Oct. 15, 1980, Ser. No. 276,338

Claims priority, application United Kingdom, Oct. 16, 1979, 7935861; Feb. 27, 1980, 8006627

Int. Cl.³ H04N *9/54, 5/72*

U.S. Cl. 358—89 **14 Claims**



1. Apparatus for displaying an apparent three dimensional image comprising:

(i) display means for providing a distorted two dimensional image of an original scene, the distorted image having a greater magnification at its top than at its bottom;

(ii) means for displaying this distorted image on a real or virtual saddle shaped surface inclined with its bottom part closer to an observer than its top part, the saddle shaped surface being convex in a horizontal plane with a smaller radius at the bottom than the top and straight or concave in a vertical plane.

4,414,566

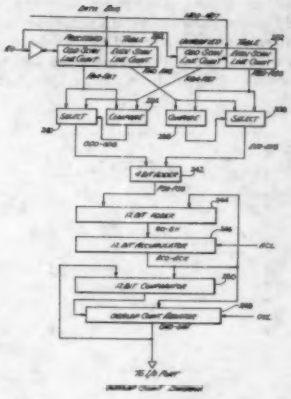
SORTING AND INSPECTION APPARATUS AND METHOD

John J. Peyton, Santa Barbara; Robert L. Thomason, Corona del Mar, and Hubert W. Evinger, Tustin, all of Calif., assignors to Industrial Automation Corporation, Goleta, Calif.

Filed Apr. 3, 1981, Ser. No. 250,780

Int. Cl.³ H04N *7/18*

U.S. Cl. 358—101 **39 Claims**



1. In a bottle sorting system, the improvement comprising

video camera means for receiving at least one two-dimensional image of at least a visually distinctive portion of a target bottle within the field of view of said video camera and for providing a video signal in response thereto

digitizing means coupled to said camera means for providing a first plurality of digital signals responsive to said video signal, each said digital signal summarizing, in digital form, the features of a respective portion of the target bottle

storage means for storing second pluarlities of digital signals, each of said digital signals within one of said second pluralities of digital signals summarizing, in digital form, the features of a respective portion of a bottle of one of the predetermined types of bottle to be sorted; and

correlation means for correlating said first plurality of digital signals with each of said second plurality of digital signals to identify which of said predetermined types of bottles the target bottle most closely correlates.

4,414,567

PATTERN GENERATING CIRCUIT

Herbert Berke, Phoenix, Ariz., and Joseph Portoghese, Altamonte Springs, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 24, 1981, Ser. No. 305,075

Int. Cl.³ H04N *7/02*

U.S. Cl. 358—139 **9 Claims**

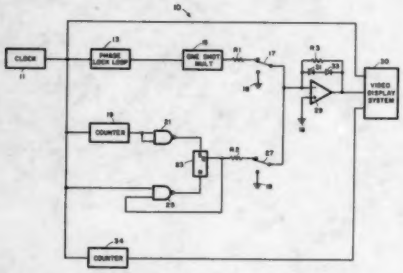
1. A pattern generating circuit for a one thousand line display comprising, in combination:

means having an output, for generating a horizontal sync signal, said horizontal sync signal having a series of uniformly spaced pulses of a first predetermined frequency of 33 kilohertz;

means having an input connected to the output of said horizontal sync signal generating means, and an output, for producing, in response to said horizontal sync signal, a first video component signal having a series of uniformly spaced pulses of a second predetermined frequency, said second frequency selected to provide a particular horizontal spacing in said pattern;

a one-shot multivibrator having an input connected to the output of said first video component signal producing means and an output, for deriving a pulse suitable for generating narrow vertical lines from each pulse of said first video component signal;

means having an input connected to the output of said horizontal sync signal generating means and an output, for producing, in response to said horizontal sync signal, a second video component signal having a series of uniformly spaced pulses of a third predetermined frequency, said third frequency selected to provide vertical spacing equivalent to said horizontal spacing; said second video component signal producing means comprising:



a counter having an input connected to the output of said horizontal sync signal genrating means, and an output;

a first NAND gate having first and second inputs connected to the output of said counter, and an output;

a second NAND gate having first and second inouts and an output, with the first input thereof connected to the output of said horizontal sync signal generating means;

a flip-flop having a set input connected to the output of said first NAND gate, a reset input connected to the output of said second NAND GATE, and a Q output connected to the second input of said second NAND gate;

means having an input and an output, with the input thereof connected to the output of said multivibrator and the output of said second video component signal producing means, for summing said first and second video component signals so as to provide at the output thereof a video signal; and

means having an input connected to the output of said horizontal sync signal generating means and an output, for producing, in response to said horizontal sync signal, a vertical sync signal.

4,414,568

DEVICE FOR THE MEASUREMENT, IN OPERATION, OF NON-LINEARITY PRODUCTS IN A TELEVISION TRANSMITTER

Claude Cluniat, and Mariano Dominguez, both of Paris, France, assignors to L.G.T. Laboratoire General des Telecommuniqations, France

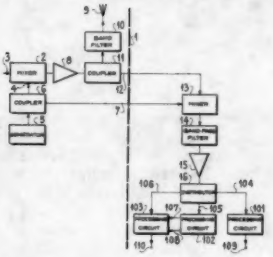
Filed Dec. 17, 1980, Ser. No. 217,458
Claims priority, application France, Dec. 21, 1979, 79 31488
Int. Cl.³ H04N *7/62, 9/62*
U.S. Cl. 358—139 **6 Claims**

1. In an equipment for transmission and/or retransmission of television signals comprising a final power amplification stage having a modulated intermediate frequency information signal input, a local oscillation signal input and an output coupled to a transmission antenna through a band filter,

a device for measuring in operation, level of non linearity products generated in said equipment comprising:

a mixer having two inputs respectively coupled to said output and to a said local oscillation signal input of said power stage, and an output,

a first processing circuit having a signal input coupled to the output of the mixer, a control input and an output, said first circuit comprising a first band-pass filter for selecting an intermodulation product outside the frequency band of the information signal having an output, said first circuit comprising a first band-pass filter for selecting an intermodulation product outside the frequency band of the information signal having an output, a first detector having an input coupled to the output of said band-pass filter and an output, a sampling circuit having a signal input coupled to the output of the first detector and a control



input which is the control input of said first circuit, and an output for supplying a signal having an amplitude proportional to the selected intermodulation product, and a measuring circuit having an input coupled to the output of said sampling circuit and an output which is the output of said first circuit for supplying corresponding intermodulation measure,

and a second processing circuit having an input also coupled to the output of the mixer and an output coupled to the control input of said first circuit comprising a second band-pass filter for selecting video frequency signal having an output, a second detector having an input coupled to the output of said second filter and an output and a control circuit having an input coupled to the output of said second detector and an output which is the output of said second circuit, for supplying a control signal during moments corresponding to at least one predetermined level of the video frequency signal.

4,414,569

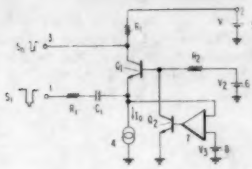
TRANSISTOR CIRCUIT

Kazuo Tokuda, and Tokio Sawataishi, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jan. 13, 1982, Ser. No. 339,225
Claims priority, application Japan, Jan. 14, 1981, 56-4264
Int. Cl.³ H04N *5/08*
U.S. Cl. 358—153 **17 Claims**

1. A transistor circuit for separating a synchronizing signal from a composite video signal, comprising a transistor having an emitter connected to an input terminal via a capacitor and further connected to a constant-current source, a collector connected to an output terminal from which an output signal corresponding to said synchronizing signal is derived, and a base connected to a bias voltage source, said composite video

signal being supplied to said input terminal, a comparator for comparing a voltage at the emitter of said transistor with a



predetermined reference voltage, and means responsive to an output signal of said comparator for turning said transistor off.

4,414,570
CIRCUIT ARRANGEMENT FOR EXTRACTING A FIELD SYNCHRONIZING SIGNAL FROM A TELEVISION SYNCHRONIZING SIGNAL

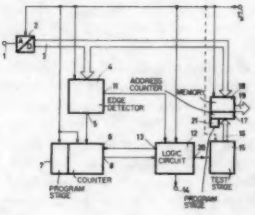
Dirk Braune, Ahrensburg, and Wolfgang Schwartz, Hamburg, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 7, 1981, Ser. No. 309,334

Claims priority, application Fed. Rep. of Germany, Oct. 8, 1980, 3037987

Int. Cl.³ H04N *5/04*

U.S. Cl. 358—154 **8 Claims**



1. A circuit arrangement having binary clock pulse controlled stages for extracting a field synchronizing signal from a television synchronizing signal having at least line and field synchronizing pulses the amplitude of which extends between a black level and a peak level, said circuit arrangement comprising:

a source of said binary clock pulses,

means connected to said source of clock pulses for providing said television synchronizing signal,

a detector connected to said source of clock pulses, and

a time measuring element connected to said source of clock pulses, said means for providing said television synchronizing signal connected to said detector for applying said television synchronizing signal thereto, said detector being periodically made operative by a clock signal from said source of clock pulses for producing a first test signal when said television synchronizing signal substantially reaches said peak level, said first test signal starting said time measuring element which produces a switching signal when said time measuring element reaches a preset value before it is reset, said detector producing a second test signal when said black level is substantially reached, said second test signal resetting said time measuring element when the preset value has not yet been reached by said time measuring element, the period of said clock signal being significantly shorter than the duration of a line synchronizing pulse.

4,414,571
TELEVISION RECEIVER

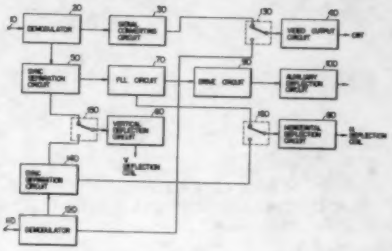
Takeshi Kureha, Yawata; Teruo Katsoka, Sakai; Taiichi Saeki, Katano, and Minoru Takeda, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 8, 1981, Ser. No. 309,850

Claims priority, application Japan, Oct. 9, 1980, 55-141201; Oct. 9, 1980, 55-141202; Oct. 9, 1980, 55-141203; Oct. 9, 1980, 55-141204; Oct. 9, 1980, 55-141205

Int. Cl.³ H04N *5/04*

U.S. Cl. 358—158 **10 Claims**



1. A television receiver comprising:

first demodulating circuit means for demoduating an applied video signal of a standard television system into signals containing primary color information;

first sync separation circuit means for separting a first horizontal synchronizing signal and a vertical synchronizing signal from said video signal of a standard television system;

PLL circuit means for receiving said first horizontal synchronizing signal and forming a second horizontal synchronizing signal having a frequency n times that of the first horizontal synchronizing signal where $n \geqq 2$;

signal converting means for converting said demodulated signals into signals having a time base compressed to 1/n of that of said demodulated signals so as to correspond to the second horizontal synchronizing signal;

second demodulating circuit means for demodulating an applied video signal of a second television system into signals containing primary color information, said second television system ulitizing a horizontal synchronizing signal having a frequency about n times that of the standard television system;

second sync separation circuit means for separating a horizontal synchronizing signal and a vertical synchronizing signal from said video signal of said second television system;

vertical deflection circuit means for driving a vertical deflection coil;

first switch means for supplying the vertical synchronizing signal separated in said first sync separation circuit means to said vertical deflection circuit means when said television receiver is to display the video signal of a standard television system and for supplying the vertical synchronizing signal separated in said second sync separation circuit means to said vertical deflection circuit means when said television receiver is to display the video signal of said second television system;

horizontal deflection circuit means which drives a horizontal coil;

second switch means for supplying said second horizontal synchronizing signal to said horizontal deflection circuit means when said television receiver is to display the video signal of said standard television system and for supplying the horizontal synchronizing signal separated in said second sync separation circuit means to said horizontal deflection means when said television receiver is to display the video signal of said second television system;

video output circuit means for amplifying signals supplied from a third switch means and for driving a cathode ray tube; and

third switch means for selectively supplying the signals converted in said signal converting means to said video output circuit means when said television receiver is to display said video signal of said standard television system and for supplying the signals demodulated in said second demodulating circuit means to said video output circuit means when said television receiver is to display said video signal of said second television system.

4,414,572

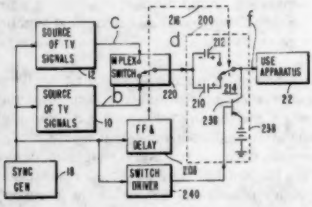
CLAMP FOR LINE-ALTERNATE SIGNALS

Robert E. Flory, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 15, 1982, Ser. No. 358,381

Int. Cl.³ H04N 5/18

U.S. Cl. 358—172 **6 Claims**



1. A clamp for television signals from a plurality of sources, comprising:

a source of a first plurality of line-sequential television signals, each line including a recurrent identifiable portion;

a second plurality of coupling capacitors having a terminal in common, each coupling capacitor having a second terminal, said terminal in common being coupled to said source of television signals, said first and second pluralities being equal;

a source of reference voltage to which said recurrent identifiable portions of said television signals are to be clamped;

first controllable switch means including a controlled current path having first and second terminals and a control electrode, said first terminal of said controlled current path being coupled to said source of reference voltage;

second controllable switch means coupled to said second terminals of said coupling capacitors and to said second terminal of said controlled current path of said first controllable switch means;

first control means coupled to said second controllable switch means for coupling said source of television signals to said second terminal of said first switch means by sequential coupling of said second terminals of said coupling capacitors with said second terminal of said first switching means in timed relationship with the line-sequence of said source of television signals; and

second control means coupled to said control terminal of said first controllable switch means for rendering said controlled current path conductive during said recurrent identifiable portions of each horizontal line.

4,414,573

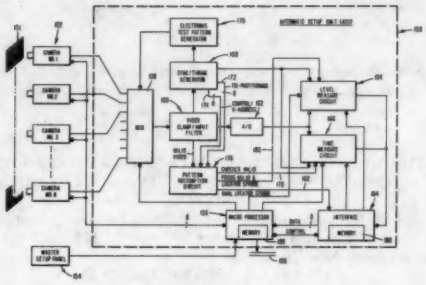
PATTERN RECOGNITION CIRCUIT FOR RELIABLY DISTINGUISHING BETWEEN DIFFERENT PORTIONS OF A DIASCOPE PATTERN DURING VIDEO CAMERA SETUP

Karl H. Griesshaber, and Charles A. Bialo, both of San Jose, Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Apr. 8, 1981, Ser. No. 252,108

Int. Cl.³ H04N 9/62; G06K 9/00

U.S. Cl. 358—163 **10 Claims**



1. A pattern recognition circuit for distinguishing between given pattern configurations of an optical test pattern as the latter is being scanned by a beam on successive lines of a corresponding video field during automatic television camera setup, the pattern configurations including spaced white-to-black coarse locators having white-to-black transitions and bands of white-to-black checker blocks, comprising;

strobe circuit means for generating a succession of continuous locator strobes within one field which are indicative of each locator's white-to-black transition in successive lines of the respective coarse locators within the field; and

qualifying circuit means coupled to the strobe circuit means for qualifying a locator strobe of the continuous locator strobes generated by the strobe circuit means in response to a selected valid succession of locator strobes taken from successive lines of the respective coarse locators.

4,414,574

VIDEO AMPLIFIER WITH BLANK STRETCHING

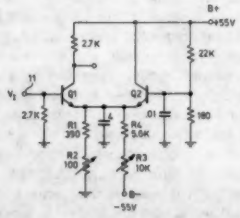
Harry W. Verlinden, Waterloo, Canada, assignor to Electrohome Limited, Kitchener, Canada

Filed Dec. 4, 1981, Ser. No. 327,432

Claims priority, application United Kingdom, Dec. 23, 1980, 8041239

Int. Cl.³ H04N 5/14

U.S. Cl. 358—184 **3 Claims**



1. A video amplifier comprising first and second NPN transistors having base, collector and emitter electrodes; means connecting said collector electrode of said first transistor to a source of positive potential via a first resistor; means connecting said collector electrode of said second transistor to a source

of positive pontential; means for connecting said emitter electrode to each other and via a first resistive network to a source of negative potential and via a second resistive network including a variable resistor to a terminal at a potential less positive than said positive potentials and less negative than said negative potential; a network for biasing on said second transistor connected to said base electrode of said second transistor; an input terminal connected to the base electrode of said first transistor; means for supplying to said input terminal a video input signal varying between a blanking level, a black level and a maximum brightness level, the maximum brightness level being more positive than the black level and the black level being more positive than the blanking level; and an output terminal connected to said collector electrode of said first transistor.

4,414,575

AUTOFOCUS SYSTEM

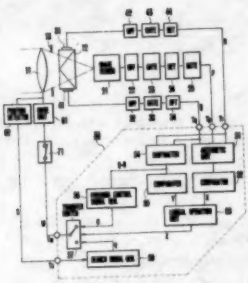
Manabu Yamamoto, Odawara, and Shuhei Tanaka, Musashimurayama, both of Japan, assignors to Hitachi Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 18, 1981, Ser. No. 322,704

Claims priority, application Japan, Nov. 21, 1980, 55-163340; Dec. 17, 1980, 55-178194; Dec. 17, 1980, 55-178598

Int. Cl.³ H04N 9/28

U.S. Cl. 358—227 **5 Claims**



1. In an autofocus system in which the image definition of an object to be picked up is detected by image sensor means disposed on a light path of an image-forming optical system and converted into electric signals, and the image-forming position of the image-forming optical system is controlled by using the electric signals, the improvement wherein said autofocus system comprises:

a main image sensor and at least one sub-image sensor disposed in a predetermined optical positional relationship with the main image sensor, said main and sub-image sensors being used as said image sensor means;

means connected to said main image sensor and sub-image sensor, for converting the image definition from each of the sensors into an electric signal;

control means for judging the focussed state of said image-forming optical system by a predetermined arithmetic operation performed on at least said electric signals and generating, in accordance with the results of said judgement, a control signal for adjustment of at least the image-forming position of said image-forming optical system;

a beam splitter disposed between said image-forming optical system and said main image sensor;

a single sub-image sensor for reception of separated light from the splitter provided movably along said light path; and

electric signals representative of different image definitions generated at different positions of the sub-image sensor;

whereby the image-forming position of the image-forming optical system is controlled by said control signal.

4,414,576

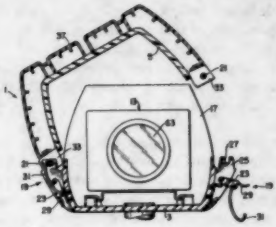
HOUSING ASSEMBLY FOR ELECTRICAL APPARATUS

Rein S. Randmae, Fort Salonga, N.Y., assignor to Vicon Industries, Inc., Plainview, N.Y.

Filed Sep. 25, 1981, Ser. No. 305,401

Int. Cl.³ H04N 5/26, 7/18

U.S. Cl. 358—229 **11 Claims**



1. A housing assembly for electronic surveillance apparatus, comprising:

complementary first and second housing members defining an enclosed region when joined together;

first hinge means for joining said first and second housing members in hinged relationship about a first axis;

second hinge means for joining said first and second housing members in hinged relationship about a second axis, different from said first axis; and

said first and second hinge means each having means for independently releasing its respective hinge means to permit said first and second housing members to hinge about the axis of the other hinge means.

4,414,577

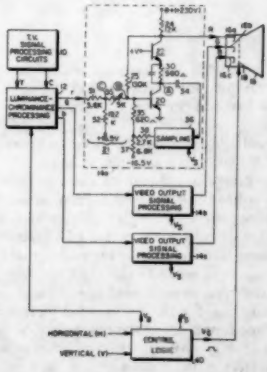
MANUALLY GAIN PRESETTABLE KINESCOPE DRIVER IN AN AUTOMATIC KINESCOPE BIAS CONTROL SYSTEM

James C. Tallant, II, and James Hettiger, both of Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed Jul. 15, 1982, Ser. No. 398,632

Int. Cl.³ H04N 5/68

U.S. Cl. 358—242 **13 Claims**



1. In a video signal processing system including an image reproducing device for displaying an image in response to video signals applied to an intensity control electrode thereof, said video signals including image information and blanking intervals, apparatus comprising:

means for providing video signals at an output thereof, said output exhibiting a black level reference voltage during video signal blanking intervals;

amplifier means for supplying video signals to said intensity control electrode;

a signal path for coupling said output of said signal providing means to said amplifier means during said image and blanking intervals;

adjustable means coupled to said signal path for determining the signal gain of said amplifier means in accordance with a current conduction characteristic of said adjustable means varying with the setting thereof, said intensity control electrode being undesirably subject to bias variations with variations in the setting of said adjustable means;

bias control means, operative during given intervals within video signal blanking intervals, for automatically controlling the bias of said image reproducing device in response to the bias condition of said intensity control electrode to maintain a desired level of black image representative current conducted by said intensity control electrode; and

means for maintaining a prescribed conduction characteristic for said adjustable means, independent of its actual setting, during said given intervals when said bias control means is operative.

4,414,578

FLYBACK TRANSFORMER

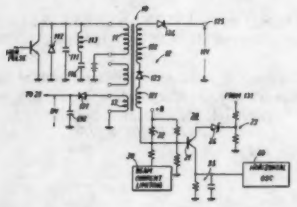
Toshio Takeichi, Osaka, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Continuation of Ser. No. 101,433, Dec. 10, 1979, abandoned. This application Apr. 6, 1982, Ser. No. 365,964

Claims priority, application Japan, Dec. 15, 1978, 53-158965

Int. Cl.³ H04N *5/68*

U.S. Cl. 358—243 **13 Claims**



1. An apparatus for use in a television receiver having a cathode ray tube for restricting the amount of X-ray radiation from said cathode ray tube comprising:

a core;

a low voltage coil wound outside said core, said low voltage coil for receiving an input voltage;

a high voltage coil wound on a second bobbin outside of said low voltage coil in a coaxial relation with said low voltage coil for providing a high voltage which is induced therein;

a voltage detecting coil means of a relatively small number of turns with respect to the number of turns of said high voltage coil, wound outside of said high voltage coil in a coaxial relation with said low voltage coil and said high voltage coil for having induced therein a relatively small voltage representing the magnitude of the output voltage of said high voltage coil, and for providing an output indicative of the output of said high voltage and wherein said voltage detecting coil means is electrically isolated from said high voltage coil and said low voltage coil and is electromagnetically coupled to said high voltage coil, and a third bobbin having a length substantially less than the length of said second bobbin, said voltage detecting coil means being wound on said third bobbin wherein said third bobbin has a hollow portion, and said second bobbin, on which said high voltage coil is wound, is inserted into said hollow portion of said third bobbin; and

means responsive to the output of said voltage detecting coil means exceeding a predetermined value for restricting the amount of X-ray radiation being radiated from said cathode ray tube.

4,414,579

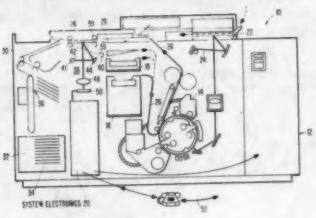
INFORMATION TRANSMITTING AND RECEIVING STATION UTILIZING A COPIER-PRINTER

Anthony J. Dattilo; James F. McDonald, both of Longmont, and Carl A. Queener, Lyons, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1979, Ser. No. 108,114

Int. Cl.³ H04N *1/00, 1/30, 1/42*

U.S. Cl. 358—256 **17 Claims**



1. A method of providing for delayed transmission of information contained in a multipage document without requiring a delay in manual operation upon the document itself, comprising the steps of:

providing a multipage document containing information to be transmitted;

providing a copier having a concealed paper storage tray and an optical scanner;

making a visually perceptible paper copy of the document by immediate manual use of said copier;

automatically storing the paper copy in the copier's paper tray, without manual intervention, as said copy is made;

thereafter, and with possible delay, automatically fetching the paper copy stored in the copier's paper tray, without manual intervention, and delivering the copy to the optical scanner, to thereby scan the paper copy to determine visually perceptible information contained therein; and

automatically, and without manual intervention, transmitting the information contained in the paper copy.

4,414,580

PROGRESSIVE TRANSMISSION OF TWO-TONE FACSIMILE

Ottar Johnsen, Middletown, and Arun N. Netravali, Westfield, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 1, 1981, Ser. No. 268,847

Int. Cl.³ H04N *7/12*

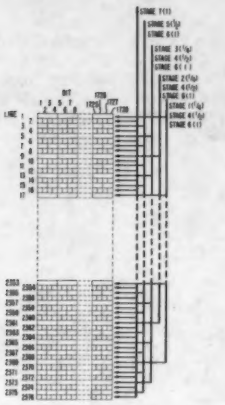
U.S. Cl. 358—260 **45 Claims**

1. A method for transmitting signals representing picture elements (pels) of a line scanned picture, the method CHARACTERIZED BY the steps of:

transmitting signals which define each 2^nth line of said line scanned picture, where n is an integer greater than one, and wherein each transmitted signal has a horizontal resolution of 2^m pels, where m is an integer greater than zero and less than or equal to n; and

progressively increasing the vertical resolution of the picture defined in the prior step by transmitting signals hav-

ing a horizontal resolution of 2^m pels which define additional lines including each 2^{n-p}th line of said line scanned



picture, where p is an integer greater than zero and less than n.

4,414,581

IMAGE SIGNAL PROCESSING METHOD AND APPARATUS THEREFOR

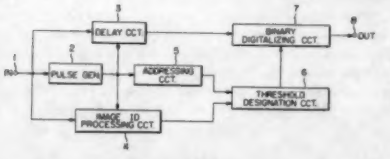
Yuzo Kato, Yokohama; Shunichi Ishihara, Kodaira; Yasushi Sato, Kawasaki; Nobuyoshi Tanaka, Yokohama; Naoto Kawamura, Inagi, and Hisashi Nakatsui, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 20, 1981, Ser. No. 313,302

Claims priority, application Japan, Nov. 1, 1980, 55-154017

Int. Cl.³ H04N *1/40*

U.S. Cl. 358—280 **13 Claims**



1. An image signal processing apparatus, comprising:

means for identifying the content of entered image signals;

means for storing plural groups of threshold values for binary digitalization of the image signals;

means for selecting a suitable group of threshold values in accordance with the identification of the content of entered image signals by said identifying means, and for providing threshold values of the group so selected from said storing means; and

means for binary digitalization of said image signals by means of the threshold values provided by said selecting and providing means.

4,414,582

MULTIPLE LINE PROCESSING OF VIDEO SIGNALS IN A SCANNING TYPE DOCUMENT READER

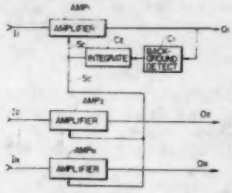
Satoru Ogasawara, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jan. 6, 1982, Ser. No. 337,551

Claims priority, application Japan, Jan. 9, 1981, 56-1904

Int. Cl.³ H04N *1/40*

U.S. Cl. 358—282 **9 Claims**



1. An original document reader capable of simultaneously scanning a first line and at least a second line on an original document to produce video signals corresponding to information read from each of said lines, comprising first video signal processing circuitry for said first line including processing means for processing first video signals from said first line in accordance with a control signal and means for generating said control signal in accordance with the said first line video signals, second video signal processing circuitry for processing second video signals from said at least second line in accordance with an input signal, and, said control signal applied to said second video signal processing circuitry as said input signal.

4,414,583

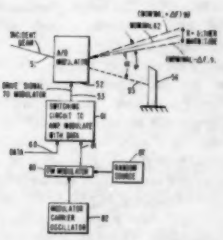
SCANNED LIGHT BEAM IMAGING METHOD AND APPARATUS

Ross B. Hooker, III, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 2, 1981, Ser. No. 317,691

Int. Cl.³ H04N *1/30*

U.S. Cl. 358—300 **20 Claims**



1. An electrophotographic machine for producing printed sheets bearing an image of data produced on an electrophotographic medium by a scanning light beam driven across said medium in line by line fashion, comprising:

an electrophotographic medium;

charging means for charging said medium to a uniform electrostatic charge;

imaging means for selectively discharging said medium in accordance with data to be reproduced in order to produce a desired latent image, said imaging means including a light source for producing a light beam and scanning means for repeatedly scanning said light beam in parallel and adjacent linear scan lines across said electrophotographic medium, said imaging means further including

beam modulation means including data signal producing means for causing said beam to produce said latent image in accordance with data desired for reproduction, said beam modulation means further including random signal means for displacing said light beam in a random manner orthogonal to said linear scan lines to prevent the development of a regular interstitial pattern at the boundaries of adjacent scan lines;

developer means for applying toner to said latent image to render said image visible; and

fuser means for fusing the toned image to a printed sheet.

4,414,584

HIGH-SPEED PLAYBACK FOR VIDEODISCS

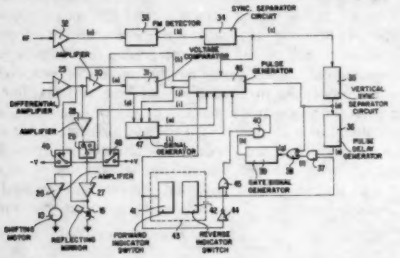
Hirotaka Kurata, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 2, 1981, Ser. No. 307,878

Claims priority, application Japan, Oct. 7, 1980, 55-141774

Int. Cl.³ H04N *5/783*; G11B *21/08*

U.S. Cl. 358—342 **6 Claims**



1. In a videodisc playback system of the type having means to mount and rotate a videodisc on which are recorded composite video signals in a spiral track, sensing means for reading the video signals from the spiral track, shifting means for shifting the position of said sensing means along a radial of the video disc, and control means for controlling said shifting means so that (a) the position of the sensing means is maintained on the track or (b) the sensing means is shifted from one track to another, the improvement consisting of a high speed playback circuit comprising:

sync separating means responsive to the output of said sensing means for extracting vertical synchronizing signals from the composite video signals read from the videodisc,

delay pulse generator means responsive to the output of said sync separating means for producing at least one delay pulse for each vertical synchronizing pulse, where the delay pulses are delayed by a prescribed time from said vertical synchronizing signals such that the delay pulses and the vertical synchronizing pulse fall within a fixed time period greater than the horizontal blanking interval of the composite video signals,

a single forward indicator switch and a single reverse indicator switch producing, respectively, forward and reverse indicator signals where the forward indicator signal indicates movement along said radial in one direction and the reverse indicator signal indicates movement along said radial in the direction opposite said one direction,

said control means including means responsive to said vertical synchronizing signals, said delay pulses, and said forward and reverse indicator signals for controlling said shifting means to shift said sensing means along said radial to effect fast playback in the direction selected by the operator controlled indicator switch, the number of tracks the sensing head is shifted each field of the composite video signal depending on whether one or both of said forward and reverse indicator switches are operated where the fastest playback occurs in response to both indicator switches being operated.

4,414,585

METHOD OF TRANSMITTING AN AUDIO SIGNAL VIA A TRANSMISSION CHANNEL

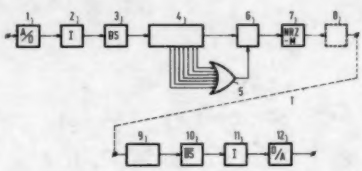
Wilhelmus J. Van Gestel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 21, 1981, Ser. No. 313,446

Claims priority, application Netherlands, May 8, 1981, 8102251

Int. Cl.³ G11B *5/09*

U.S. Cl. 360—40 **8 Claims**



1. A method of converting an analog audio signal into a binary signal and vice versa, specifically intended for use in a transmission system for recording and reproducing said audio signal on a record carrier, the analog audio signal being converted into a binary signal by means of an analog-to-digital conversion, for converting samples of the analog audio signal into digital data words of M data bits each, and a modulation, for converting said data words into a binary signal, which modulation is such that in said binary signal data bits of a first type are represented by the presence of a level transition and data bits of a second type by the absence of such a level transition, and the binary signal being reconverted into the analog audio signal by means of a demodulation, by which the binary signal is demodulated and converted into digital data words of M data bits each, and a digital-to-analog conversion, by which said data words are converted into analog sample values of the audio signal, characterized in that the analog-to-digital conversion is adapted to supply data words comprising M − 1 amplitude bits, which together in binary coded form represent the sample magnitude, and one sign bit, which represents the polarity of the sample, said digital-to-analog conversion being such that a sample having zero value results in M − 1 amplitude bits of the first type and that prior to the modulation each data word is divided into N subwords, the data bits of the data word being arranged in such a way in the subwords that each subword contains one of the N most significant amplitude bits of the data words, while during reconversion of the binary signal into the analog audio signal, upon modulation of the binary signal, the data bits of the N subwords are again rearranged to form data words of M data bits and the digital-to-analog conversion is adapted to convert said data words comprising M − 1 amplitude bits and one sign bit into an analog sample value.

4,414,586

PILOT SIGNAL RECORDING AND REPRODUCING SYSTEM

Akira Hirota, Chigasaki; Seisuke Hiraguri, and Takashi Uchimi, both of Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Oct. 5, 1981, Ser. No. 308,666

Claims priority, application Japan, Oct. 7, 1980, 55-139362; Oct. 7, 1980, 55-139363

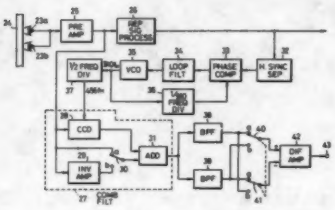
Int. Cl.³ G11B *21/04, 21/02*

U.S. Cl. 360—70 **6 Claims**

1. A pilot signal recording and reproducing system in which mutually different first through fourth frequencies are recorded as pilot signals on a recording medium in a specific

order together with an information signal such that one pilot signal is recorded for one track, and pilot signals recorded on both sides of a track which is to be reproduced having mutually different frequencies and being included as crosstalk within a reproduced signal reproduced from said recording medium are respectively discriminated and separated by a filter circuit, to obtain a tracking error information, said pilot signal recording and reproducing system comprising:

a frequency generating circuit for successively generating a first frequency, a third frequency, a second frequency, and a fourth frequency in this frequency order or in a reverse order for every recording unit of one track, said first and second frequencies being mutually separated frequencies, selected from a first frequency group consisting of i frequencies satisfying an equation $f_{ai}=K_i f_x$ where K_i is $(N_i-\frac{1}{2})$ or N_i when i arbitrary natural numbers are designated by N_i and f_x is a predetermined frequency, said third



and fourth frequencies respectively being frequencies approximately equal to said first and second frequencies, selected from a second frequency group consisting of j frequencies satisfying an equation $f_{bj}=K_j f_y$ where K_j is $(N_j-\frac{1}{2})$ or N_j when $K_i=N_i$ and K_j is $(N_j-\frac{1}{2})$ when $K_i=(-N_i-\frac{1}{2})$, when j arbitrary natural numbers are designated by N_j and f_y is a predetermined frequency;

a comb filter for frequency-selecting pilot signals having mutually different frequencies recorded on both sides of a track which is to be reproduced;

a control circuit for alternately changing over and controlling a delay time of a delay circuit within said comb filter to $1/f_x$ or $1/f_y$ for every reproducing period of one track; and

first and second filter circuits for respectively discriminating and separating pilot signals having mutually different frequencies obtained from said comb filter.

4,414,587

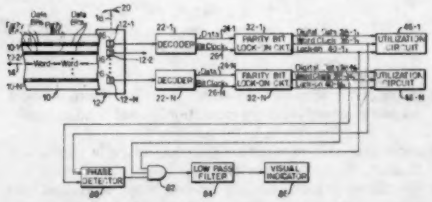
SKEW SENSING FOR DIGITAL TAPE PLAYBACK

Charles S. Weaver, Palo Alto; Joseph H. Chadwick, Menlo Park; John M. Yarborough, Jr., Palo Alto; Floyd A. Brown, Mountain View, and Donald J. Burch, Los Altos, all of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Dec. 17, 1981, Ser. No. 331,566

Int. Cl.³ G11B 5/43

U.S. Cl. 360—76 **17 Claims**



1. In a playback system for magnetically reproducing digital data signals which include parity bit signals recorded along parallel tracks of a plural track magnetic recording medium, the combination comprising,

a transducing head having a transducing element for each of said plurality of tracks for reproducing signals recorded along said tracks, and

means for detecting phase shifts between parity bit signals reproduced from two of said tracks.

4,414,588

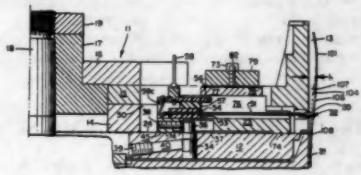
FLUID BEARING TAPE SCANNING DRUM

Richard A. Hathaway, Saratoga, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Apr. 11, 1980, Ser. No. 139,510

Int. Cl.³ G11B 5/10, 5/60

U.S. Cl. 360—84 **5 Claims**



1. A helical scan magnetic tape transport comprising coaxially mounted fixed and rotating drums having an axial gap therebetween and at least one magnetic transducing head mounted on said rotating drum remote from said gap, together with means for moving said tape in a helical path around said drums and across said gap and for driving said rotating drum to produce a pressurized gas bearing film between said tape and drums, characterized in that:

said rotating drum is provided with means in the vicinity of the transverse plane of said head normal to the drum axis for controllably venting said gas bearing film so as to reduce the film thickness at said head plane to a desired dimension that is uniform along the length of the scan of said head in said plane.

4,414,589

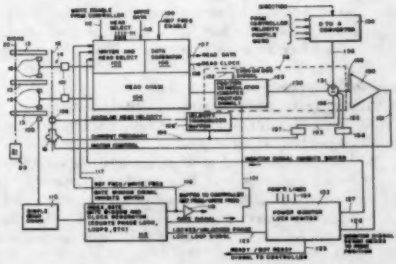
EMBEDDED SERVO TRACK FOLLOWING SYSTEM AND METHOD FOR WRITING SERVO TRACKS

Theodore A. Oliver, Ann Arbor; David L. Nelson, Milford, and Keat-Lye Chan, Ypsilanti, all of Mich., assignors to Northern Telecom Inc., Nashville, Tenn.

Filed Dec. 14, 1981, Ser. No. 330,855

Int. Cl.³ G11B 5/55, 5/58, 23/36, 27/36

U.S. Cl. 360—77 **71 Claims**



1. A servo system for positioning a read/write transducer relative to a magnetic storage disc to read and write data stored on the disc, said servo system comprising:

positioning means energizable for moving the read/write transducer to preselected radial recording positions on said disc;

drive means for providing relative movement between said disc and the read/write transducer thereby enabling the transfer of data beween said disc and the read/write transducer;

a plurality of side-by-side, closely-spaced servo tracks recorded on said disc, said servo tracks identifying said preselected radial recording positions on said disc;

said servo tracks being provided with a nonuniform radial track density, said track density of said servo tracks varying substantially continuously from track to track according to the performance of the read/write transducer common to said tracks from generally more dense at the periphery of said disc where transducer performance is high to generally less dense at the interior of said disc where transducer performance is low;

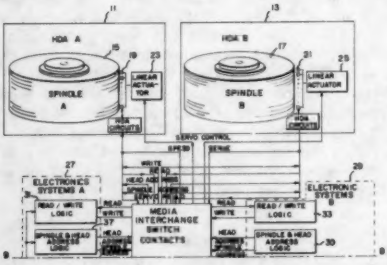
servo control means for sensing the output of the read/write transducer and selectively energizing said positioning means for positioning said read/write transducer at preselected radial recording positions on said disc.

4,414,590

MEDIA INTERCHANGE SWITCH FOR MAGNETIC DISK DRIVES

Anton W. Merdian, Jr., Boulder County; Joseph K. Jurneke, and Frank W. Pinteric, both of Adams County, all of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

Filed Jun. 29, 1981, Ser. No. 278,389
Int. Cl.³ G11B *5/012, 21/08, 21/10*
U.S. Cl. 360—97 **9 Claims**



1. In a magnetic disk drive comprising:

first and second head/disk assemblies each including a drive spindle for rotating magnetic disks, magnetic heads for writing and reading digital data signals on and from said disks, and an actuator responsive to a servo signal for moving said heads into read/write relationship with the tracks of said disks; and

first and second electronic systems each having means for generating a spindle and head address signals, logic circuits for processing said digital data signals, and means for processing servo signals;

a media interchange switch including:

latching relay means operable to two positions;

multiple pole, double throw relay contacts actuated by said latching relay means;

the spindle and head address signals, data signals and servo signals for said first head disk assembly being connected through a first set of said poles to said first electronic system on one throw of said relay contacts and through a second set of said poles to said second electronic system on the other throw of said relay contacts;

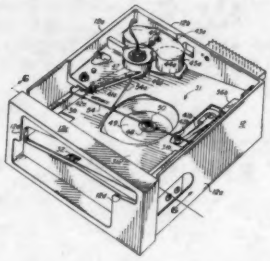
the spindle and head address signals, data signals and servo signals for said second head/disk assembly being connected through a third set of poles to said second electronic system on said one throw of said relay contacts and through a fourth set of said poles to said first electronic system upon said other throw of said relay contacts.

4,414,591

DUAL ACCESS FLEXIBLE DISK DRIVE

John W. Wenner, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 18, 1980, Ser. No. 160,756
Int. Cl.³ G11B *5/016, 5/54, 21/22, 23/02*
U.S. Cl. 360—99 **8 Claims**



1. A device for mounting a cartridge containing a flexible magnetic recording disk therein, comprising

drive means in said device for providing rotational motion to said disk;

a pair of transducing means in said device for simultaneously magnetically cooperating with both magnetic recording surfaces of said disk in a non-contact mode;

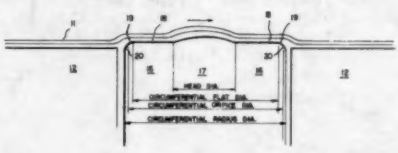
tray means pivotably mounted in said device, said tray means being adapted to receive said cartridge when said tray means is in a first position which is tilted from the horizontal, said tray means being pivotable about an axis which is offset horizontally from the centerline of said drive means to a second horizontal position after insertion of said cartridge therein to position both surfaces of said disk adjacent said transducing means and position a central portion of said disk adjacent said drive means.

4,414,592

SUPPORT FOR STABILIZING THE MOVEMENT OF A MAGNETIC MEDIUM OVER A MAGNETIC HEAD

Paul D. Losee, Layton, and David G. Norton, Ogden, both of Utah, assignors to Iomega Corporation, Ogden, Utah

Filed May 1, 1981, Ser. No. 259,698
Int. Cl.³ G11B *5/60, 5/22, 17/32, 15/64*
U.S. Cl. 360—102 **5 Claims**



1. A magnetic head coupler which stabilizes the movement of a magnetic record medium in relation to said head comprising:

a circumferential member having an aperture in which said magnetic head is supported;

a flat circumferential surface on said member around said aperture on the side facing said record medium and extending in a plane substantially parallel to the plane of rotation of said medium; and

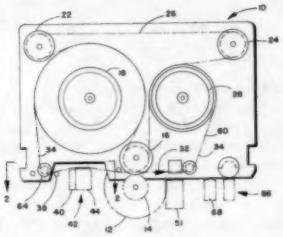
a circumferential orifice surface outside of and around said flat circumferential surface, and extending from said flat surface away from said plane of rotation of said record medium, said orifice surface forming an orifice for airflow control over said flat circumferential surface to couple said magnetic medium to said magnetic head by the Bernoulli effect created by movement of air between said medium and said flat circumferential surface.

4,414,593

STREAMING CARTRIDGE TAPE DRIVE

William R. Miller, and Jones V. Howell, both of Costa Mesa, Calif., assignors to Archive Corporation, Costa Mesa, Calif.

Filed Oct. 8, 1981, Ser. No. 309,573
Int. Cl.³ G11B *21/08, 5/56, 5/58, 21/24*
U.S. Cl. 360—102 **21 Claims**



1. A tape cartridge drive having a read-write head for writing and reading information on the tape wherein said head is driven into different respective locations with respect to the tape for providing different tracks or channels for writing and reading on the tape, wherein the improvement comprises:

means for supporting said magnetic head;

means for moving said magnetic head across said tape in a lateral manner in order to change the location of said head with respect to said tape; and,

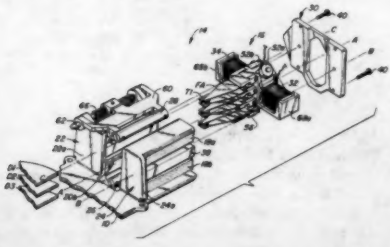
means for causing said tape to move longitudinally and be provided with an air cushion between the tape and the magnetic head when said head is moved laterally across the face of said tape.

4,414,594

LINEAR ACTUATOR FOR A MEMORY STORAGE APPARATUS

Paul L. Farmer, San Martin; Frank C. Gibeau, Los Altos; Stanley F. Brown, Cupertino, and Garold W. Plonczak, Santa Clara, all of Calif., assignors to Atasi Corporation, San Jose, Calif.

Filed Feb. 26, 1982, Ser. No. 352,943
Int. Cl.³ G11B *5/55;* H02K *41/02*
U.S. Cl. 360—106 **21 Claims**



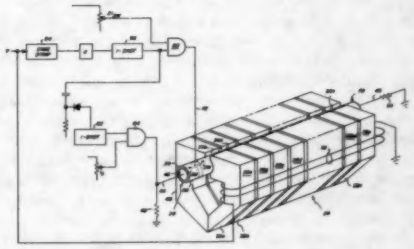
1. A transducer actuator assembly for a rotating disc memory apparatus comprising: a carriage; means for mounting at least one transducer at one end of the carriage; means adjacent the periphery of the rotating disc of the memory apparatus for guiding the carriage for movement along a desired linear path of travel relative to the disc; a pair of symmetrically disposed electromagnetic motors, each including a central pole, for reciprocating the carriage to transfer the transducer to a desired track location on the rotating disc including drive coil means mounted to the carriage for forming at least two identical effective coil sections that are respectively symmetrically arranged about a plane that extends through the center of the carriage and that is parallel to its linear direction of travel, and at least two identical pairs of permanent magnets stationarily mounted to the memory apparatus near the periphery of the disc at the opposite sides of the carriage for forming two air gaps that respectively register with said two coil sections, said coil sections surrounding and forming air gaps with said central poles, whereby when said coil means is energized motive forces are applied generally along two transversely spaced lines that are symmetrical about said center plane of the carriage.

4,414,595

SCANNING MAGNETIC HEAD WITH PROPAGATING DOMAIN WALL

Frederick J. Jeffers, Escondido, Calif., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 3, 1981, Ser. No. 289,846
Int. Cl.³ G11B *5/12*
U.S. Cl. 360—115 **7 Claims**



1. Magnetically actuable apparatus comprising

(a) a plurality of magnetic structures having respective high reluctance gaps therein, each of said magnetic structures being actuable when its respective high reluctance gap is magnetically short-circuited,

(b) means supporting a thin magnetic film of the type in which a domain wall may exist between regions thereof which are magnetically saturated in differing directions, said means being disposed to reside in the gaps of said plurality of magnetic structures in such a way that said thin film extends from one side to the other of each said gap,

(c) means for effecting a domain wall in said thin magnetic film, and

(d) means for positioning said domain wall so that it resides within and across one or another of the gaps within said plurality of magnetic structures, whereby the relatively high permeability of the thin film within the domain wall thereof effectively actuates the magnetic structure the gap of which is magnetically short-circuited by said domain wall at any given time,

said means supporting a thin magnetic film being an electrically conductive wire having a circumferentially oriented thin film of magnetic material thereon, and

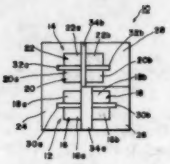
said means for effecting a domain wall in said thin magnetic film being means coupled to said wire at a point thereof between its opposite ends for effecting a current

flow within said wire that is either simultaneously toward or simultaneously away from the opposite ends of said wire, whereby when said current flow within said wire is of sufficient strength a domain wall is effected within said thin magnetic film as the fields produced by said current flow respectively reenforce and counter the quiescent circumferential orientation of the magnetic material that forms said film.

4,414,596
MAGNETIC HEAD ASSEMBLY

Niro Nakamichi, Higashikurume, Japan, assignor to Nakamichi Corporation, Tokyo, Japan

Filed Jun. 17, 1981, Ser. No. 274,554
Claims priority, application Japan, Jun. 24, 1980, 55-88331[U]
Int. Cl.³ G11B *5/10, 5/25*
U.S. Cl. 360—129 **3 Claims**

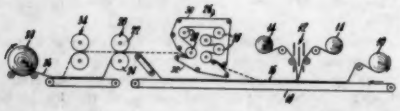


1. A magnetic head for reversibly recording and reproducing having a plurality of operating gaps substantially in line which are formed between a plurality of pairs of left-hand and right-hand core pieces facing each other with shielding between adjacent pairs, said left-hand and right-hand core pieces including first and second core piece groups, characterized by the combination of: a common holding member to hold one-hand core pieces together; first and second divided holding members to hold first and second core piece groups of other-hand core pieces, respectively; first spacer means interposed between said first core piece group of said other-hand core pieces and the corresponding core piece group of said one-hand core pieces; and second spacer means interposed between said second core piece group of said other-hand core pieces and the corresponding core piece group of said one-hand core pieces; said first and second spacer means establishing recording and reproducing gap groups, respectively, with said recording gap group having a gap width greater than said reproducing gap width and substantially in line therewith.

4,414,597
FLOPPY DISC LINER

Annamaria Cornin, Plainsboro, N.J., assignor to Chicopee, New Brunswick, N.J.

Filed Sep. 14, 1981, Ser. No. 301,915
Int. Cl.³ G11B *23/02*
U.S. Cl. 360—133 **2 Claims**

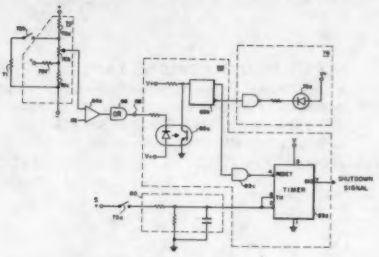


1. A floppy disc envelope container comprising sheet material fabricated into an envelope, said sheet material having an inner surface on which is laminated a fabric comprising a thermal bonded and emboss bonded nonwoven fabric comprising textile grade polyester staple fibers and polyester staple fibers having a melting point below about 150° C.

4,414,598
REGULATED POWER SUPPLY

John R. Nowell, Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Jun. 4, 1982, Ser. No. 384,848
Int. Cl.³ H02H *3/10, 7/10*
U.S. Cl. 361—18 **4 Claims**

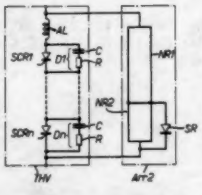


1. A power supply, comprising:
(a) switching regulator means for outputting a regulated DC voltage over a variable range of DC current;
(b) over-current detector means, having a reference circuit, for detecting when said DC current exceeds a predetermined threshold, said predetermined threshold established by said reference circuit, thereupon outputting an over-current signal causing said switching regulator means to be shut down;
(c) a circuit element;
(d) gate means for operatively connecting said over-current detector means to said switching regulator means; and
(e) switch means for manually operatively connecting:
(i) said circuit element to said reference circuit to modify said predetermined threshold, and
(ii) an inhibit signal to said gate means thereby inhibiting said over-current signal from being transmitted to said switching regulator means.

4,414,599
ARRESTER AND A SEMICONDUCTOR CIRCUIT ARRANGEMENT WITH A PROTECTION DEVICE INCLUDING THE SAME

Sumio Kobayashi, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Mar. 11, 1982, Ser. No. 357,146
Claims priority, application Japan, Mar. 24, 1981, 56-41784
Int. Cl.³ H02H *7/09, 7/125*
U.S. Cl. 361—56 **14 Claims**



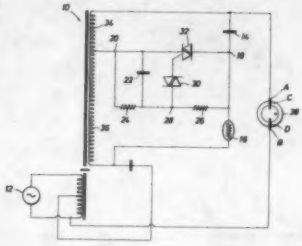
1. An arrester comprising:
first nonlinear resistance means;
second nonlinear resistance means connected in series with said first nonlinear resistance means; and
by-pass circuit means connected in parallel with said second nonlinear resistance means for short-circuiting said second nonlinear resistance means only when a voltage of a predetermined polarity is applied to said second nonlinear resistance means.

4,414,600

PROTECTION DEVICE FOR HIGH INTENSITY GASEOUS DISCHARGE LAMP STARTING CIRCUIT

Karl Schweickardt, Cazenovia, N.Y., assignor to Esquire, Inc., New York, N.Y.

Filed Dec. 21, 1981, Ser. No. 332,469
Int. Cl.³ H02H 9/04
U.S. Cl. 361—56 3 Claims



1. A high voltage starting and protection circuit for a high intensity, gaseous discharge lamp, comprising

transformer means connected to line power for providing transformed AC voltage,

voltage divider means including a capacitor and a resistor connected to said transformer means,

voltage breakdown means connected to said transformer means and said voltage divider, and

trigger means for gating on said voltage breakdown means and discharging said capacitor to provide starting pulses to the HID lamp when it is unlit,

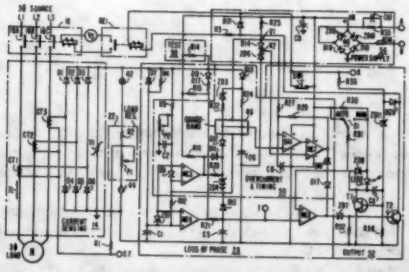
said resistor having a non-linear negative coefficient of resistance for surges in voltage above a predetermined threshold resulting from a sudden open operating lamp, a sudden drop of resistance value of said resistor dissipating said voltage surges and preventing destructive conduction of said voltage breakdown means at said surges of high voltage.

4,414,601

SOLID-STATE LOAD PROTECTION SYSTEM HAVING A TEST FEATURE

Ernest F. Conroy, Jr., Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 27, 1981, Ser. No. 258,093
Int. Cl.³ H02H 3/093
U.S. Cl. 361—97 5 Claims



1. A load protection system, comprising:

sensor means for sensing circuit current in an electrical circuit, said sensor means providing an output signal which is related to said circuit current;

inverse time overload means connected to said output of said sensor means, for receiving said output signal therefrom, said overload means providing an output trip signal, said latter signal being provided at a delayed time which delayed time is inversely proportional to the magnitude of said electrical circuit current provided said magnitude of said electrical current exceeds a predetermined level for a predetermined period;

overload simulating means connected to said inverse time overload means for testing said load protection system, said overload simulating means providing an overload simulation signal to said inverse time overload means the magnitude of which exceeds said predetermined level for said predetermined period;

circuit control trip means connected to said inverse time overload means and to said electrical circuit for opening said electrical circuit when said output trip signal is provided; and

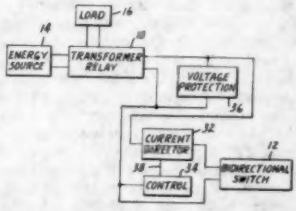
replaceable load resistor means connected in parallel circuit relationship with said sensor means for producing a voltage whose value is variable within a predetermined voltage range, said overload simulating means being connected in circuit relationship with said sensor means so that upon the removal of of said overload simulation signal is produced.

4,414,602

CURRENT DIRECTOR AND INTERFACE CIRCUIT FOR A TRANSFORMER RELAY

Douglas R. Mosier, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Co., Saint Paul, Minn.

Filed Dec. 18, 1981, Ser. No. 332,145
Int. Cl.³ H01H 47/32
U.S. Cl. 361—190 29 Claims

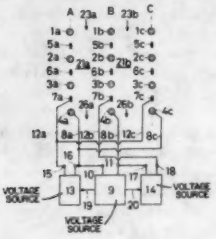


1. A current director in combination with a transformer relay and a bidirectional switch, said transformer relay having a primary winding adapted to be coupled to an alternating current energy source, having a load switch adapted to control the application of said energy source to a load, and having a secondary winding which controls said load switch to a first position and a second position depending upon current flow in said secondary winding above a predetermined switching threshold in a first direction and a second direction, respectively, said current director operatively coupled to said secondary winding of said transformer relay and to said bidirectional switch, said current director preventing current flow in said secondary winding in said second direction above said predetermined switching threshold for a predetermined succeeding time period after current has flowed in said secondary winding in said first direction above a predetermined inhibit threshold during a predetermined preceding time period.

4,414,603
PARTICLE CHARGING APPARATUS

Senichi Masuda, No. 605, Nishigahara 1-40-10, Kita-Ku, Tokyo-to, Japan

Filed Mar. 23, 1981, Ser. No. 246,397
Claims priority, application Japan, Mar. 27, 1980, 55-39559; Sep. 8, 1980, 55-124401; Sep. 22, 1980, 55-132112
Int. Cl.³ H05B *5/02*
U.S. Cl. 361—227 **13 Claims**



1. A Boxer-Charger particle charging apparatus, in which a plurality of electrode assemblies each including at least one corona discharge electrode and consisting of electrode elements divided into two groups as insulated from each other so that adjacent electrode elements may belong to different groups, are disposed in an opposed relation to each other with a charging space placed therebetween, there is provided a main a.c. voltage source for applying a main a.c. voltage between opposed ones of said electrode assemblies to establish a main alternating electric field in said charging space placed between said opposed electrode assemblies, there are also provided excitation voltage sources for applying a pulse high voltage having a very short pulse duration time of 1 ns to 1 μs between said adjacent two groups of electrode elements belonging to said opposed electrode assemblies during a period contained within a half cycle of said main a.c. voltage when said opposed electrode assemblies alternately take particular polarity as synchronized with said main a.c. voltage, thereby corona discharge is generated on the corona discharge electrode when the electrode assemblies opposed to each other with said charging space placed therebetween alternately take said particular polarity of said main a.c. voltage, resulting in formation of a plasma ion source, then monopolar ions of said particular polarity are made to be emitted from the plasma ion source into said charging space and to travel across the charging space to the opposed electrode assembly of the opposite polarity, thus a current of monopolar ions which travel as alternately inverting the direction of current in synchronism with the main alternating electric field, is formed within the charging space to bombard particles to be charged which enter said charging space, from the opposite sides with said monopolar ions, and thereby the particles can be charged effectively and quickly.

4,414,604
HEAT RADIATION SYSTEM FOR ELECTRONIC DEVICES

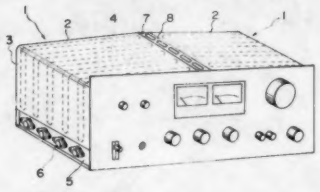
Fumio Matsui, and Yutaka Takasu, both of Saitama, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Continuation of Ser. No. 97,110, Nov. 20, 1979, abandoned. This application Apr. 2, 1982, Ser. No. 364,708
Claims priority, application Japan, Nov. 22, 1978, 53-144774
Int. Cl.³ H05K *7/20*
U.S. Cl. 361—385 **4 Claims**

1. An enclosed container for electronic devices having heat generating elements therein, comprising:

a structure enclosed by a plurality of external walls, said enclosed structure containing heat generating elements at least partially within an interior portion thereof, said enclosed structure having at least a first vertical external wall portion having a closed conduit system and a heat exchange medium filling said closed conduit system, said heat exchange medium changing states from liquid to vapor by absorbing heat generated by said elements, a lower end portion of said wall portion being thermally connected to said elements;

an inclined first roof portion having one end portion connected to an upper end portion of said first vertical external wall portion, said roof portion being formed therein with a closed conduit system, a lower end portion of said



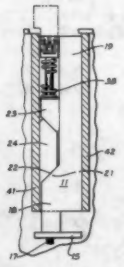
closed conduit system of said roof portion being communicated with said closed conduit system of said first vertical external wall portion, whereby said first vertical external wall portion of said first roof portion forms a first Lean-to roof construction;

a second Lean-to roof construction having the same structure as that of said first Lean-to roof construction, and a connecting member having a plurality of air passages for connecting the other ends of said first and second Lean-to roof constructions to form a ridge shaped roof structure.

4,414,605
POSITIVE LOCKING MECHANISM

John J. Chino, Arnold; Paul LePage, Towson; Robert M. Rossi, Glen Burnie, and Herman Rossman, Randallstown, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 29, 1981, Ser. No. 278,820
Int. Cl.³ H05K *7/20*
U.S. Cl. 361—388 **3 Claims**



1. An apparatus comprising a mechanism locking an electronic plug-in module to a chassis and providing good thermal interface between said module and said chassis, said mechanism comprising:

a shaft having a threaded section on one end engaging a threaded hole in a chassis and having a slotted head on the opposite end,

wedging means slidably supported on said shaft and exerting a clamping force between said module and said chassis,

spring means positioned between said slotted head and said wedging means,

a lever pivotally attached to said shaft and having a blade thereon engageable with said slotted head,

cams on said lever for compressively biasing said spring

means and said wedging means whereby said wedging means provides good thermal interface between said module and said chassis, and

said spring means comprising a helical spring and a spring compressor positioned between one end of said helical spring and said cams.

4,414,606

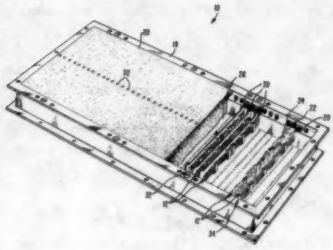
DEFOAMING ELECTRONIC HARDWARE

Edward A. Anderson, Yorba Linda; Benjamin Bennett, Beverly Hills, and Billy D. Gray, Hermosa Beach, all of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Jun. 15, 1981, Ser. No. 274,011

Int. Cl.³ H05K *1/16, 3/00*

U.S. Cl. 361—397 **12 Claims**



1. A method for uninjurious removal of electronic hardware encapsulated in foam, comprising the steps of positioning guided cutting apparatus adjacent the hardware within the foam, and cutting through the foam adjacent the hardware in a guided manner without contact with the hardware by use of the apparatus.

5. In combination, a device with encapsulated electronic hardware, said device being useful for defoaming electronic hardware and being encapsulated in foam comprising foam cutting apparatus and guide means precisely placed adjacent the hardware and embedded in the foam, said foam cutting apparatus adapted to be guided by said means when said cutting apparatus is removed from the foam and simultaneously to precisely cut through the foam in which it is embedded without harmful contact with the hardware.

4,414,607

SOLID STATE ELECTRIC DOUBLE LAYER CAPACITOR

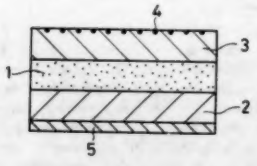
Satoshi Sekido, Yawata; Yoshito Ninomiya, Hirakata, and Yoshihiro Yamazaki, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jun. 23, 1981, Ser. No. 276,518

Claims priority, application Japan, Jun. 26, 1980, 55-87292; Aug. 8, 1980, 55-109388; Dec. 25, 1980, 55-186427

Int. Cl.³ H01G *9/00;* **B01J** *17/00*

U.S. Cl. 361—433 **7 Claims**



1. A solid state electric double layer capacitor comprising:

a polarization electrode,

a non-polarization electrode, and

a solid electrolyte disposed at least between said polarization electrode and said non-polarization electrode,

said polarization electrode being a mixture of carbon and said solid electrolyte, mixed with each other in a predetermined ratio,

said non-polarization electrode being another mixture of said solid electrolyte and a composition containing Cu and a substance selected from a group consisting of Cu_2S and TiS_2, and

said solid electrolyte having a chemical composition of $K_xRb_{1-x}Cu_4I_yCl_{5-y}$ $(0.1 \leqq x \leqq 0.25,\ 1.25 \leqq y \leqq 1.67)$.

4,414,608

ENDOSCOPE WITH ADAPTER

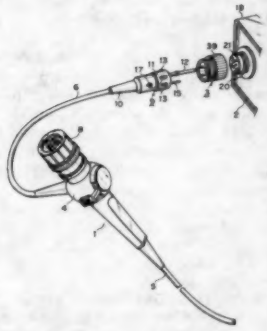
Hiroyuki Furihata, Hamura, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 30, 1981, Ser. No. 288,404

Claims priority, application Japan, Aug. 7, 1980, 55-107779

Int. Cl.³ F21V *7/04*

U.S. Cl. 362—32 **11 Claims**



1. An endoscope with an adapter used in combination with a light source unit including a socket having an electrical contact and a light source for illumination, comprising:

an endoscope including a connector having at least one electrical contact and an elongated pipe projecting from said connector and having a light guide therein; and

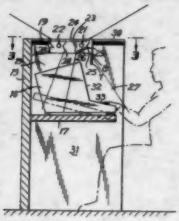
an adapter including a main body portion having: a first connection portion adapted to be removably coupled to said connector of said endoscope and a second connecting portion adapted to be removably attached to said socket of said light source unit; a first electrical contact disposed at said first connecting portion for electrically connecting with said at least one electrical contact of said connector when said connector is attached to said first connecting portion; a second electrical contact disposed at said second connecting portion for electrically connecting with said electrical contact of said socket when said second connecting portion is attached to said socket; and means for electrically connecting said first and second electrical contacts together; said adapter having a bore therein for optically connecting said light guide in said elongated pipe of said endoscope with said light source of said light source unit when said adapter is attached to both said socket of said light source unit and said connector of said endoscope.

4,414,609

LUMINAIRE FOR A VISUAL DISPLAY TERMINAL

Sylvan R. Shemitz, Woodbridge, Conn., assignor to Sylvan R. Shemitz and Associates, Inc., West Haven, Conn.

Filed Oct. 8, 1982, Ser. No. 433,509
Int. Cl.³ A61G 13/00
U.S. Cl. 362—33 16 Claims



1. An illumination system for a workstation having a backwall, a substantially horizontally disposed work surface, and a visual display terminal adapted to be viewed by an operator in a direction substantially perpendicular to said backwall, comprising:

a first light source having a first longitudinal axis,

said first light source being mounted above said visual display terminal with said longitudinal axis substantially parallel to said work surface for directing light onto said backwall;

a second light source having a second longitudinal axis,

said second light source being mounted at substantially the same height above the visual display terminal as said first light source with said second longitudinal axis disposed substantially parallel to said first longitudinal axis; and

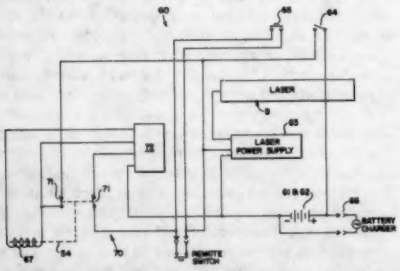
reflector means associated with said second light source for directing upwardly a portion of the light emanating from said second light source to provide ambient room lighting and for directing downwardly another portion of said light toward said work surface.

4,414,610

LASER-SIGHTED BRIEFCASE FIRING DEVICE

Edward A. Gale, 18104 Nottingham Rd., Cleveland, Ohio 44119; John J. Wetzel, III, 2005 Fernwood St., and James H. Wetzel, 2499 Trinity Dr., both of Middletown, Ohio 45042

Filed Jan. 2, 1981, Ser. No. 222,028
Int. Cl.³ F41G 1/34
U.S. Cl. 362—113 8 Claims



1. A laser-sighted firing device comprising:

a rigid mounting base,

a firing piece removably mounted on said base and including a mechanical trigger mechanism,

a sighting device mounted on said base and including a laser generator for projecting a visible aiming spot on a target approximately in the line of fire of said firing piece,

means on said base for supporting said laser generator and for adjusting the position of said laser generator relative to said firing piece to calibrate the laser beam projected therefrom relative to the line of fire of said firing piece,

a lever pivotally mounted at one end on said base for pivotal movement about an axis perpendicular to said base,

electrical actuating means connected between the other end of said lever and said base for moving said lever relative to said base,

means intermediate the ends of said lever operatively associated with said trigger mechanism for firing said piece in response to movement of said lever,

power supply means for said laser generator,

electrical means for energizing said actuating means and including a manually operable switch therefor, and

portable enclosing means in the form of a briefcase or the like for supporting said base and for concealing said firing piece,

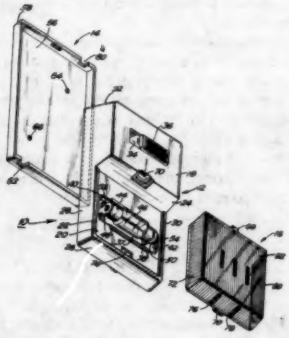
said manually operable switch including an element manually engageable from the exterior of the enclosing means, said electrical means including an electrical circuit having burst control means for limiting the number of rounds fired by said piece to a predetermined limited number each time said manually operable switch is actuated.

4,414,611

PORTABLE LIGHT

Samuel M. Seltzer, and Saul Dennison, both of Livingston, N.J., assignors to Allison Corporation, Livingston, N.J.

Filed Nov. 15, 1982, Ser. No. 441,677
Int. Cl.³ F21L 7/00
U.S. Cl. 362—183 10 Claims



1. A portable light, comprising:

a housing adapted to be selectively mounted on a support surface;

a single socket means supported on said housing for holding an illumination means in a position visible externally of said housing;

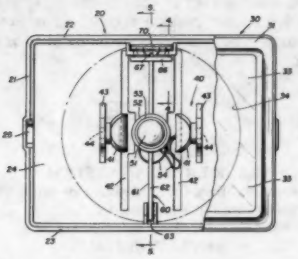
externally manipulatable switch means on said housing and;

circuit means contained within said housing, said circuit means comprising two terminal means each having a first connecting section for selectively connecting to an internal battery source, and a second connecting section for selectively connecting to an external energy source, and a common series circuit path serially interconnecting said single socket, said switch means and said circuit means, whereby said illumination means can be selectively energized by the internal battery source or the external energy source.

4,414,612
HAND-HELD LIGHT WITH MEANS FOR CONTROLLING BEAM WIDTH

Frederick J. Conforti, Aurora, and Kenneth R. Fenne, Glen Ellyn, both of Ill., assignors to Pittway Corporation, Aurora, Ill.

Filed Jan. 24, 1983, Ser. No. 460,176
Int. Cl.³ F21L *7/00*
U.S. Cl. 362—188 **20 Claims**

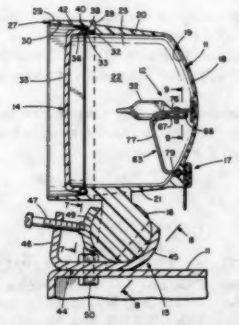


1. A battery operated flashlight comprising a housing portion for the battery, a separate head portion connected to said housing and having at least one wall, spaced-apart support members on said one wall, a carriage, support structure on said carriage extending between and slidably engageable with said support members for supporting said carriage for sliding movement between first and second extremes, a socket on said carriage for holding a bulb, and means on said carriage accessible on the exterior of said head portion for being engaged by one's finger to move said carriage to a selected position between said first and second extremes.

4,414,613
RECTANGULAR SEAL BEAM LAMP AND SUPPORT WITH HALOGEN BULB

William R. Mayer, Rochester, Ill., assignor to Stewart-Warner Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 220,248, Dec. 23, 1980, Pat. No. 4,357,651. This application Mar. 6, 1981, Ser. No. 241,395
Int. Cl.³ F21Y *29/00*
U.S. Cl. 362—267 **19 Claims**

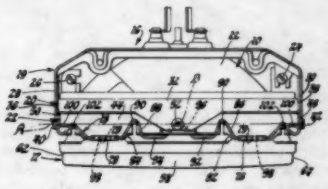


1. A disposable seal beam lamp unit, comprising; a generally rectangular reflector constructed of plastic having a paraboloidal interior reflective surface, a fastener receiving projection integrally molded with and extending from the reflector to receive fastener means to provide the sole support for the lamp unit, a connector opening in the rear of the reflector, a halogen bulb assembly having connector means extending through the connector opening, epoxy material between the connector means and the connector opening for fastening the halogen bulb assembly within the reflector, said reflector having a peripheral forwardly opening recess integrally formed therein, a generally rectangular lens having a peripheral rearwardly extending flange mounted in the forwardly opening recess in the reflector, and epoxy adhesive in the reflector recess engaging the flange for bonding the lens to the reflector said reflector, having an integrally molded forwardly extending peripheral hood directing adjacent the integral recess and surrounding the lens for limiting stray light and covering the epoxy in the lens recess.

4,414,614
SPRING CLIP FOR A VEHICLE HEADLAMP RETAINER MEMBER

David R. McMahan, and Richard W. Nicholas, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 17, 1982, Ser. No. 450,684
Int. Cl.³ F21V *21/26*
U.S. Cl. 362—269 **3 Claims**



1. In combination, a spring clip and a retainer member for maintaining a headlamp in a housing located at the front end of a vehicle body, said retainer member comprising a frame formed with a radially inwardly extending rim which is inclined towards the rear of said housing for engaging the frontal portion of the lens of said headlamp and biasing the headlamp into firm contact with said housing, hinge means formed on a first portion of said frame and adapted to connect said retainer member to said housing for pivotal movement about an axis perpendicular to the optical axis of the headlamp, a pair of flange members connected to a second portion of said frame, each of said flange members having an elongated horizontal channel formed therein, said spring clip including a pair of U-shaped sections carried by said housing and being interconnected by an intermediate section, a leg section connected to each of said U-shaped sections and including a straight portion adapted to be located in the channel of one of said flange members, and a tang formed on said straight portion and adapted to be releasably attached to said housing and cooperate with said straight portion for locking said retainer member to said housing when said hinge means is connected to said first portion of said frame.

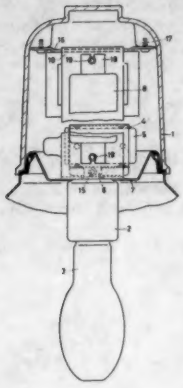
4,414,615
MOUNTING STRUCTURE FOR A HIGH PRESSURE SODIUM LAMP

George Szeker, Toronto, and Charles G. Shepherd, Oakville, both of Canada, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 4, 1981, Ser. No. 299,437
Claims priority, application Canada, Sep. 18, 1980, 360480
Int. Cl.³ F21K *7/00*
U.S. Cl. 362—264 **12 Claims**

1. A mounting arrangement for auxiliary operating components for an associated high-pressure vapor discharge lamp which comprises: an inverted open ended cup-shaped mounting structure, a U-shaped bracket having a base section from which elongated first and second legs extend, said first leg being attached to the interior of said structure and said second

leg being substantially centrally located in the open end of said structure, a holder for the associated lamp being attached to said second leg and projecting outwardly from said cup-shaped mounting structure, and a reflecting metallic heat shield extending around said U-shaped bracket and closing the open end



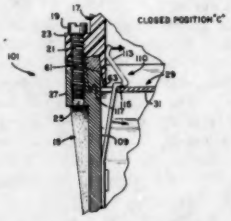
of said structure, the mounting arrangement also including a capacitor which is attached to the other side of said second leg in the interior of said structure by a mounting strap which spaces the capacitor from contact with other components and includes means to limit transfer of heat to said capacitor.

4,414,616

OUTDOOR LUMINAIRE HAVING IMPROVED LATCHING MEANS FOR THE COMPONENT MOUNTING PLATE THEREOF

Hendrik A. J. de Vos, and Elzear R. Labouliere, both of Swansea, Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Mar. 4, 1981, Ser. No. 240,521
Int. Cl.³ F21V *15/04*
U.S. Cl. 362—308 **10 Claims**



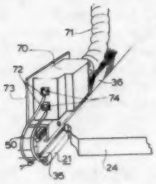
1. In a lumiaaire including a housing member, a reflector positioned within said housing member, a lamp located within said housing member relative to said reflector, a component mounting plate having lamp ballast components secured thereto and a socket member located therein and having said lamp positioned within said socket member, and latching means for securing said component mounting plate within said housing, the improvement wherein said housing is comprised of a base portion and a forward refracting portion secured to said base portion and readily separable therefrom, and said latching means comprises a pair of depressible, resilient engagement members spacedly oriented within said base portion of said housing for engaging opposite sides of said component mounting plate to hold said plate in releasable securement to said base portion of said housing such that said lamp will be accurately oriented within said forward refracting portion of said housing relative to said reflector, each of said resilient engagement members being biased in a first, closed position and movable against said biasing force in the opposite direction to a second, open position when engaged by said mounting plate during positioning and removal thereof within said base portion of said housing, said forward refracting portion of said housing member engaging said mounting plate and each of said resilient engagement members when said forward refracting portion is secured to said base portion of said housing member to assist in maintaining each of said resilient engagement members in said first, closed position against said mounting plate thereby assisting in retaining said mounting plate against said base portion.

4,414,617

TRACK LIGHTING SYSTEM

Rudolph D. Galindo, Brea, Calif., assignor to Bruce Petillo and Stan Pawlowski, both of Placentia, Calif.

Filed Oct. 19, 1981, Ser. No. 312,700
Int. Cl.³ F21S *1/04*
U.S. Cl. 362—404 **14 Claims**



1. A track lighting system comprising an elongated track member including an upstanding web adapted to act as a support point for the system and to provide stiffness thereto;

said track member defining a longitudinally extending recess having a throat portion communicating with the side opposite the web and generally exposed to the room in which the track member is to be installed;

a pair of insulated conductors extending parallel to each other within said recess and on opposite sides of said throat;

a lighting fixture support adapted to be mechanically interlocked with said track member for physical support;

said lighting fixture including a pair of insulation severing blades constituting the electrical connections to said fixture; and

means for selectively moving said blades into insulation piercing and electrical contact making relationship with said conductors in said recess.

4,414,618

LAMP SHADE ADJUSTER AND HOLDER

Darwin J. Jacobson, P.O. Box 962, Port Angeles, Wash. 98362

Continuation of Ser. No. 342,502, Jan. 25, 1982, abandoned. This application Feb. 17, 1983, Ser. No. 467,270
Int. Cl.³ F21V *17/00*
U.S. Cl. 362—417 **6 Claims**

1. A lampshade adjuster and holder comprising:

(a) a lamp harp having a stud bracket affixed to an upper portion of the harp, said stud bracket carrying a substantially vertically extending harp stud;

(b) a harp bracket having an opening to encompass the harp stud; and

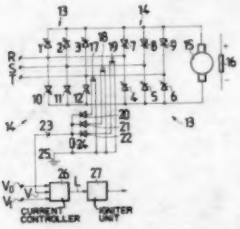
(c) a plate having an opening to encompass the harp stud, resting on the harp bracket, and including means for adjusting the mutual angular relationship of the plate and harp bracket.

4,414,619

PROCEDURE AND APPARATUS FOR SWITCHING THYRISTOR BRIDGES IN STATIC ALTERNATING CURRENT/DIRECT CONVERSION

Matti Kahkipuro, Hyvinkää, Finland, assignor to Elevator GmbH, Baar, Switzerland

Filed Dec. 22, 1980, Ser. No. 218,766
Claims priority, application Finland, Dec. 28, 1979, 794075
Int. Cl.³ H02M 7/17
U.S. Cl. 363—70 **3 Claims**



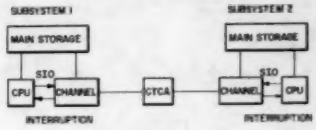
1. An improved method for switching thyristor bridges in converting alternating current statically to direct current, employing two thyristor bridges connected in parallel, whereby direct current motor means will receive both positive and negative current, comprising the steps of: applying a three phase A.C. input to said thyristor bridges and through to current sensing transformers in circuit relationship to said two thyristor bridges: feeding current sensing voltage as an input into a current controllers; directing an output voltage of said controller to an igniter unit for igniting in proper sequence respective thyristors of said bridges, each of said bridges is controlled by the same analog voltage; causing said first bridge to open in the presence of a positive controlling analog voltage; causing said second bridge to open in the presence of a negative controlling analog voltage; and shifting the bridges to a reciprocally oscillating mode of operation as the circuit approaches zero-current state; and feeding output D.C. voltages of said bridges to said motor means connected to said bridges as a load.

4,414,620

INTER-SUBSYSTEM COMMUNICATION SYSTEM

Takamitsu Tsuchimoto, Kawasaki; Saburo Kaneda, Yokohama; Tatsushi Miyazawa, Kawasaki; Toshio Shimada, Kamakura; Hideo Suzuki, Kawasaki; Mitsuru Sanagai, and Kaoru Hiraoka, both of Yokohama, all of Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Nov. 7, 1980, Ser. No. 204,931
Claims priority, application Japan, Nov. 12, 1979, 54-146164
Int. Cl.³ G06F 15/16, 15/20, 7/00
U.S. Cl. 364—200 **13 Claims**



1. An intercomputer system communication system in a data processing system comprising first and second subsystems each having main storage and each operating under the control of an operating system;

said first subsystem further comprising a sender subsystem having n sending buffers in the respective main storage;

said second subsystem further comprising a receiver subsystem having m receiving buffers in the respective main storage;

said sender subsystem further comprising a sending buffer address table in the respective main storage having n entries;

said receiver subsystem further comprising a receiving buffer address table in the respective main storage having m entries;

each of said n and m entries comprising header address information for corresponding said n sending and m receiving buffers and length information for the respective buffer;

said sender subsystem further comprising a sender buffer control data block in main storage including:

a header address for the sending buffer address table;

said n entries in said sending buffer address table;

an enqueue pointer which indicates which of said n entries is to be enqueued next; and

a dequeue pointer which indicates which of said n entries is to be dequeued next into the respective main storage;

said receiver subsystem further comprising a receiver buffer control data block in main storage including:

a header address for the receiving buffer address table;

said m entries in said receiving address buffer table;

an enqueue pointer which indicates which of said m entries is to be enqueued next; and

a dequeue pointer which indicates which of said m entries is to be dequeued next into respective main storage; and

said communication system further comprising a communication unit, operatively connected between said sender subsystem and said receiver subsystem, for transferring data stored in said n sending buffers of the sender subsystem to said m receiving buffers of the receiver subsystem.

4,414,621

INTERACTIVE VISUAL COMMUNICATIONS SYSTEM

Herbert G. Bown, Kanata, and C. Douglas O'Brien, Ottawa, both of Canada, assignors to Canadian Patents & Development Ltd., Ottawa, Canada

Continuation of Ser. No. 806,168, Jun. 13, 1977, abandoned.
This application Oct. 23, 1981, Ser. No. 314,407
Int. Cl.³ G06F 3/14
U.S. Cl. 364—200 **8 Claims**

1. An interactive visual communications system for maintaining identical visual pictures at a number of terminals linked

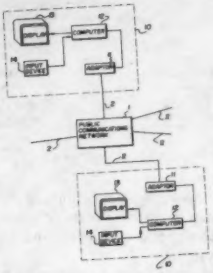
by narrow bandwidth transmission lines, each of said terminals comprising:

visual display means;

input means for providing input instructions at said terminal;

means coupled to the input means for converting said instructions to graphic task instructions;

interaction handler means coupled to the converting means for receiving and for transmitting the graphic task instructions over the narrow bandwidth transmission lines to one or more further terminals, and for receiving graphic task



instructions generated at the one or more further terminals over the narrow bandwidth transmission lines; and

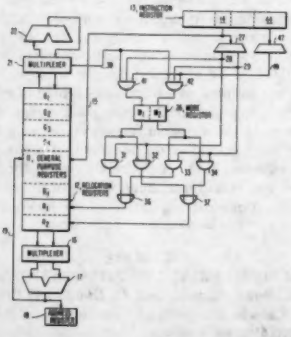
processor means coupled to the interaction handler means for receiving the converting means graphic task instructions and the graphic task instructions received from the one or more further terminals for processing the graphic task instructions, said processor means being coupled to the display means for controlling the display means to modify and maintain the picture on the display means in accordance with said graphic task instructions.

4,414,622

ADDRESSING SYSTEM FOR A COMPUTER, INCLUDING A MODE REGISTER

Keiji Matsumoto, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 956,157, Oct. 31, 1978, abandoned.
This application Feb. 19, 1981, Ser. No. 235,377
Claims priority, application Japan, Oct. 31, 1977, 52-131190
Int. Cl.³ G06F *9/26*
U.S. Cl. 364—200 **8 Claims**



1. An addressing system for generating a working address in a central processing unit of an electronic digital computer, said central processing unit comprising a plurality of general purpose registers (11) each storing general purpose register contents therein, a plurality of relocation registers (12) each storing relocation register contents therein, an instruction register (13) for storing a program instruction including a mode register content change instruction (44), and general purpose register specifying means (14, 15) responsive to at least a portion of said program instruction for specifying one of said general purpose registers, said addressing system comprising:

mode register means (26) for producing a plurality of mode register output signals at one time;

a first decoder (27) responsive to said portion of said program instruction for producing a decoder output signal designating one mode register output signal to be selected from the mode register output signals currently being produced by said mode register means;

selecting means (31–34) responsive to said first decoder output signal for selecting said one mode register output signal and for reproducing a selection signal in accordance with said one mode register output signal;

means (36, 37) responsive to said selection signal for selecting one of said relocation registers;

means (16, 17) for combining the contents of the specified general purpose register and the selected relocation register to generate said working address;

result signal producing means (22) responsive to the content of the general purpose register specified by said portion of said program instruction for producing a result signal; and

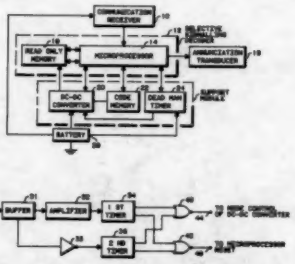
gating means (41, 42) enabled by said decoder output signal and said mode register content change instruction for providing at least a portion of said result signal to said mode register means for use in changing at least one of said mode register output signals.

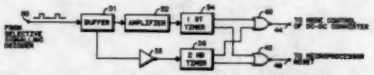
4,414,623

DUAL DEADMAN TIMER CIRCUIT

Walter L. Davis, Plantation, and James E. Jacobson, Jr., Ft. Lauderdale, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 1, 1980, Ser. No. 192,772
Int. Cl.³ G06F *1/04*
U.S. Cl. 364—200 **10 Claims**





1. In a device including a microprocessor having means to generate signal pulses indicative of proper function and a multi-mode power supply supplying power to the microprocessor, a deadman timer comprising:

input means for receiving signal pulses from the microprocesssor indicative that the microprocessor is functioning properly;

first timing means coupled to the input means for determining if the signal pulses have been interrupted;

second timing means coupled to the input means for determining if a pulse persists for a predetermined time interval;

first output means coupled to said first and second timing means for providing a reset pulse to the microprocessor in response to either an interruption in the signal pulses or a pulse having an improper pulse width interval for reinitializing the operation of the microprocessor;

second output means coupled to said first and second timing

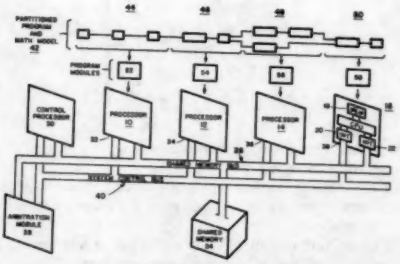
means for switching the multi-mode power supply to a high output mode in response to either said interruption in signal pulses or improper pulse width interval thereby insuring that the multi-mode power supply can provide the power required to reinitialize the microprocessor.

4,414,624

MULTIPLE-MICROCOMPUTER PROCESSING

Charles F. Summer, Jr., Orlando, Fla.; Robert O. Pettus; Ronald D. Bonnell, both of Lexington, S.C.; Michael N. Huhns, Irmo, S.C., and Larry M. Stephens, Columbia, S.C., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 19, 1980, Ser. No. 208,355
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—200 **8 Claims**



1. A processor that is an electronic machine for automatically manipulating data in accordance with a programmed task that is partitionable, comprising:

a first microprocessor having memory, adapted to independently process data in accordance with a first portion of said task automatically;

a second microprocessor having memory, adapted to independently process data in accordance with a second portion of said task automatically;

first means interconnecting said first microprocessor and said second microprocessor for communicating data;

second means interconnecting said first microprocessor and said second microprocessor for conveying machine instructions;

means coupled to said first interconnecting means and to said second interconnecting means for providing global memory storage of data in computer processing format accessible to said first microprocessor and said second microprocessor;

means coupled to said first interconnecting means and to said second interconnecting means for controlling interactions between said first microprocessor, said second microprocessor, and said storage means;

means electronically immediately adjoining said interaction controlling means, coupled to said first interconnecting means and said second interconnecting means for controlling processor functions through action as master of said second interconnecting means;

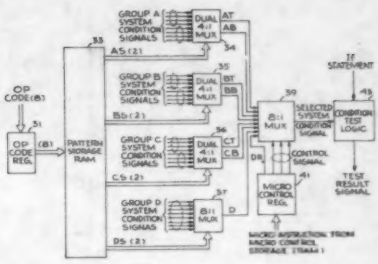
wherein selected portions of the data stored in said global memory means are duplicatively stored in said memory of said first microprocesor and pertain to said first portion of said task, and other selected portions of the data stored in said global memory means are duplicatively stored in said memory of said second microprocessor and pertain to said second portion of said task.

4,414,625

SYSTEM CONDITION SELECTION CIRCUITRY

Christopher F. Miller, Diamond Bar, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jan. 24, 1980, Ser. No. 114,971
Int. Cl.³ G06F *9/00, 9/22*
U.S. Cl. 364—200 **7 Claims**



1. In a digital data processing system wherein data processing is performed by performing a plurality of macroinstructions, wherein each macroinstruction includes an operation code portion indicating the type of data processing to be performed thereby, and wherein each macroinstruction is performed by one or more microinstructions, an improved system condition signal selection means for selecting from a relatively large number of system condition signals provided by said system during operation thereof a particular system condition signal to be tested during each microinstruction, said improved system condition signal selection means comprising:

operation code storage means for storing the operation code portion of each new macroinstruction to be performed;

a memory for storing a plurality of predetermined signal patterns, each signal pattern being respectively associated with a different operation code, said memory being responsive to an operation code stored in said operation code storage means for outputting the respective signal pattern associated therewith;

first selection means operative prior to the performance of the microinstructions corresponding to said new macroinstruction, said first selection means being responsive to a signal pattern outputted from said memory for preselecting a particular relatively small plurality of system condition signals from said relatively large plurality of system condition signals and for maintaining this preselection throughout the performance of the microinstructions of the macroinstruction corresponding thereto;

microinstruction storage means for sequentially storing each microinstruction to be performed, each microinstruction including a predetermined portion for use in selecting a system condition signal to be tested during execution of the microinstruction; and

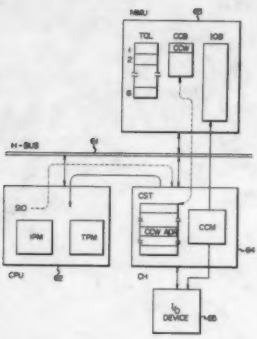
second selection means operative in conjunction with the performance of each microinstruction, said second selection means being responsive to said predetermined bits of the microinstruction stored in said microinstruction storage means for selecting one of the preselected relatively small number of system condition signals for testing during performance of the microinstruction.

4,414,626

INPUT/OUTPUT CONTROL SYSTEM AND METHODS

Michio Arai, Kawasaki; Yukio Shirasagawa, Kunitachi; Tsutomu Sakamoto, Kokubunji, and Keizo Aoyagi, Fuchu, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 949,942, Oct. 10, 1978, abandoned. This application Dec. 5, 1980, Ser. No. 213,579
Claims priority, application Japan, Oct. 12, 1977, 52-121391
Int. Cl.³ G06F *1/00*
U.S. Cl. 364—200 11 Claims



1. A method for controlling an input/output control system having a plurality of input/output units, a plurality of channels for controlling the plurality of input/output units, a central processing unit, and a main memory unit connected to said central processing unit and to said channels for storing channel control blocks having control information to allow said plurality of channels to control the transfer of data between said main memory unit and the plurality of input/output units, said control information including at least one starting memory address which identifies locations in said main memory unit where data transfer with said plurality of input/output units will begin and at least one count value, each corresponding to a different one of said at least one starting memory address, each said at least one count value indicating the size of said data transfer with said corresponding one of said plurality of input/output devices, said method comprising the steps of:

storing, by said central processing unit, said control information in said channel control blocks in said main memory;

executing, by the central processing unit, a single instruction containing a channel number identifying a designated channel, a unit number identifying an input/output unit to be activated, and channel control block address information to identify the location in said main memory for a selected channel control block, thereby delivering said channel control block address information to said designated channel;

accessing, by the designated channel, through a single operation of said designated channel, the location in said main memory corresponding to said channel control block address specified by said information contained in said single instruction and reading the selected channel control block specified by said channel control block address information into said channel; and

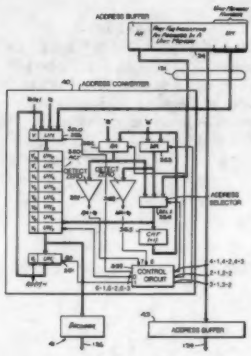
controlling, by the designated channel, the data transfer for said input/output unit identified by said single instruction in accordance with the control information in said selected channel control block read into said designated channel including identifying, by the designated channel, each location in said main memory unit for the specified data transfer with said input/output unit using said at least one starting address and count value.

4,414,627

MAIN MEMORY CONTROL SYSTEM

Teruo Nakamura, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 54,176, Jul. 2, 1979, abandoned. This application Aug. 27, 1981, Ser. No. 296,978
Claims priority, application Japan, Jul. 3, 1978, 53-81321
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—200 2 Claims



1. A data processing system comprising

a central processing unit,

a main memory having a plurality of unit memories each of which is accessible by means of a unit memory number address,

an input/output control unit connected to said central processing unit and to said main memory for performing data transfer between said main memory and external devices,

said central processing unit having an instruction execution portion arranged to produce a rescue type initial program load command signal following interruption of operation of the system in order to reconstruct the main memory to ensure continuous address space, and

a main memory control unit connected to receive from said central processing unit, and from said input/output control unit, address numbers and unit memory number addresses preassigned to corresponding address numbers, together with associated bits indicating whether the unit memory represented by each unit memory number address is operative, said main memory control unit being connected to receive from said central processing unit said rescue type initial program load command signal to reallocate unit memory number addresses with respect to said address numbers, said main memory control unit comprising an address converting apparatus having an address converting table comprising a plurality of storage locations for said unit memory number addresses and associated indicating bits, each of said storage locations being accessible by means of a address converting table storage location address number,

means connected to receive from said central processing unit and said input/output control unit said unit memory number addresses preassigned to the respective address numbers together with associated bits indicating whether the unit memory represented by each unit memory number address is operative and for storing said unit memory number addresses in the respective storage locations of said address converting table,

shifting means connected to receive said rescue type initial program load command signal from said central processing unit and, in response thereto, to perform a reconstruction operation in which the unit memory number addresses which have been stored in said storage locations

are shifted therein to ensure continuous storage space, and shifting means comprising:

read-out means and write-in means, each individually connected to said address converting table and responsive to the address number for sequentially applying address converting table storage location address numbers to said address converting table to sequentially access the different storage locations therein,

a read-out register connected to said address converting table to receive the unit memory number address and its associated indicating bit from the storage location in said address converting table accessed by said read-out means,

a write-in register means connected to said read-out register and to said address converting table to receive from said read-out register each unit memory number address having an associated indicating bit which indicates the operative condition of the respective unit memory and to write said unit memory number address into the storage location which is accessed by said write-in means and not to write into said address converting table any unit memory number address having an associated indicating bit which does not indicate the operative condition of the respective unit memory and

sequencing means connected to said read-out means and said write-in means and programmed to cause said read-out means to sequentially access the different storage locations of said address converting table in succession upon each read-out operation by said read-out means and to cause said write-in means to sequentially access different storage locations of said address converting table in succession upon each write-in operation by said write-in means

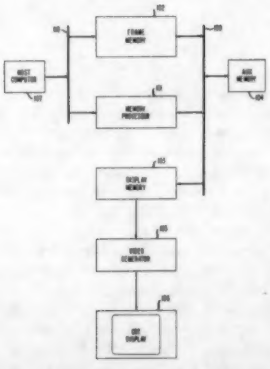
whereby said storage locations of said address converting table are accessed sequentially according to the order of the address numbers so that the unit memory number addresses to which said address numbers are assigned are arranged in the storage locations of said address converting table according to said order of address numbers.

4,414,628

SYSTEM FOR DISPLAYING OVERLAPPING PAGES OF INFORMATION

Sudhir R. Ahuja, Aberdeen, and Dhiraj K. Sharma, Gillette, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 31, 1981, Ser. No. 249,505
Int. Cl.³ G06K *15/18*
U.S. Cl. 364—200 **10 Claims**



1. In a display system for processing pages of display information elements, pages being designated as being on top of or below other pages with respect to visibility upon display, a display memory (103) having a plurality of locations for storing display information elements, a display means for displaying elements stored within said display memory means (102) for containing a plurality of pages of display information elements, each of said contained elements being destined to a respective location in the display memory, and means (101) for transferring the information element of the pages from the containing means to the display memory in accordance with the element destinations and in descending order of said top/-bottom designations an auxiliary memory having a plurality of storage locations which respectively correspond to separate locations of said display memory for registering in said auxiliary memory storage locations whether an information element has been transferred to corresponding locations in the display memory, and

the transferring means includes means (201–210) for selecting pages for transfer from the containing means in a descending order, topmost designated page first, for writing an information element of the selected page into the destined location of the display memory when the auxiliary memory does not register that an information element has been priorly transferred to the destined location and for registering in the auxiliary memory that an information element has now been transferred to the destined location when the information element is written in such location,

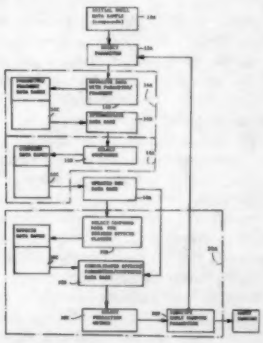
whereby when elements of a page are not transferred to the display memory because their destined locations in the display memory already contain elements previously transferred thereto, as ascertainable from the indications in said auxiliary memory, the non-transferred elements are not displayed by said display means and are thus hidden from view.

4,414,629

METHOD AND APPARATUS FOR MAKING CORRELATIONS AND PREDICTIONS USING A FINITE FIELD OF DATA OF UNORGANIZED AND/OR PARTIALLY STRUCTURED ELEMENTS

John H. Waite, 46 Grove St., Haddonfield, N.J. 08033

Continuation of Ser. No. 26,178, Apr. 2, 1979, abandoned. This application Nov. 10, 1980, Ser. No. 205,339
Int. Cl.³ G06F *7/00*
U.S. Cl. 364—300 **6 Claims**



1. A method of identifying physical items with specific characteristics and sorting those items from a relatively large group of physical items, said method comprising the steps of:

(a) providing descriptive names for the items in said group,

(b) encoding said names and storing the corresponding codes in computer memory,

(c) providing one or more descriptor words describing said specific characteristics,

(d) encoding said descriptor words and storing the corresponding codes in computer memory,

(e) sequentially matching said descriptor word codes with

said name codes in a computer on a character-by-character basis,

(f) counting the number of character coincidences for each of said names,

(g) identifying each of said names for which the number of coincidences significantly exceeds the random coincidence level for the characters in said descriptor words and names, and

(h) restructuring and organizing said physical items by sorting said physical items on the basis of said names so identified.

4,414,630

ANTI-SKID VEHICLE BRAKING SYSTEMS

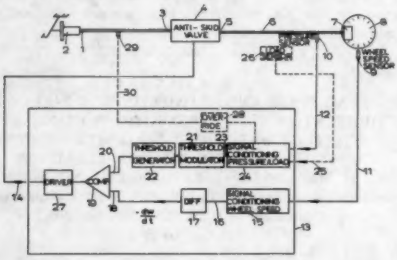
Alan L. Harris, Coventry, and Alfred K. White, Birmingham, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Feb. 17, 1981, Ser. No. 234,956

Claims priority, application United Kingdom, Mar. 19, 1980, 8009186

Int. Cl.³ G06F *15/20*

U.S. Cl. 364—426 **7 Claims**



1. An anti-skid vehicle braking system comprising a brake actuator associated with a vehicle wheel, a modulator assembly for modulating the fluid pressure applied to said brake actuator, a deceleration sensor for measuring the deceleration of said wheel, an electronic control unit for controlling the operation of said modulator assembly in response to signals produced by said deceleration sensor, and a pressure sensor for producing a signal corresponding to the current brake actuator pressure, said control unit incorporating at least part of said deceleration sensor, a threshold generator circuit for generating a deceleration threshold value, a comparator for comparing a wheel deceleration signal produced by said deceleration sensor with said deceleration threshold value and a threshold modulator circuit responsive to said current pressure signal, an input of said threshold generator circuit being connected to an output of said threshold modulator circuit, an output of said threshold generator circuit being connected to a threshold value input of said comparator for providing said comparator with a current threshold value, an input of said threshold modulator being connected to said pressure sensor, said threshold modulator producing at its output a modulation signal for controlling the threshold generator, and the threshold generator being arranged to vary said current threshold value in response to said modulation signal in accordance with a predetermined relationship between the threshold value and the brake actuator pressure, said predetermined relationship providing a higher threshold value for a higher brake actuator pressure.

4,414,631

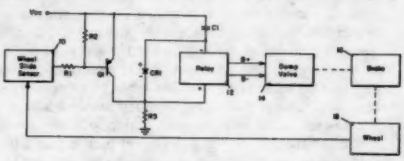
BRAKE CONTROL SYSTEM

Arden L. Schug, Torrance, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Apr. 22, 1981, Ser. No. 256,363

Int. Cl.³ B60T *8/02*

U.S. Cl. 364—426 **24 Claims**



1. A system for controlling a dump valve of a braking system on a wheel, comprising:

a relay having an output connected to the dump valve; and

means for energizing said relay during an occurrence of wheel slide to provide an actuating signal to the dump valve to prevent braking action on the wheel for the duration of the wheel slide or for a predetermined maximum time if the duration of the wheel slide exceeds said predetermined maximum time.

4,414,632

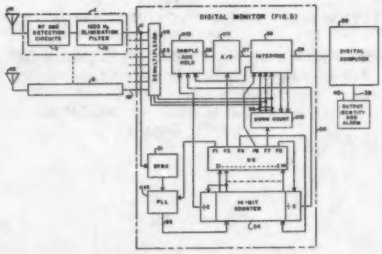
AUTOMATIC MONITORING SYSTEM FOR RADIO SIGNAL

Robert A. Murrell, 45375 Fox La. E., 106, Utica, Mich. 48087

Filed Apr. 7, 1981, Ser. No. 251,825

Int. Cl.³ G06F *15/20*

U.S. Cl. 364—487 **8 Claims**



1. A system for monitoring a modulated RF signal for certain parameters of a radiated signal, wherein the modulation of the RF signal comprises a composite signal of plurality of tone frequencies which normally have a fixed phase relation such that the composite signal has repetitive cycles at a given lower frequency with respect to the tone frequencies, the RF signal being detected and demodulated to provide the composite signal; said system comprising:

monitor apparatus comprising sample and hold means, input means to apply said composite signal to the sample and hold means, timing means to provide timing signals at predetermined points of time in the composite cycle, said timing signals being applied to said sample and hold means to obtain sample signals representing the voltage of the composite signal at said pedetermined points during one cycle of the composite signal, said sample signals being supplied to computation means which perform arithmetic operations on combinations of the sample signals to determine said certain parameters.

4,414,633

DATA PROCESSING AND RECORDING APPARATUS

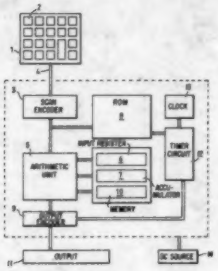
David A. Churchill, Leamington Spa, England, assignor to British Gas Corporation, London, England

Filed Feb. 24, 1981, Ser. No. 237,764

Claims priority, application United Kingdom, Nov. 17, 1980, 8036798

Int. Cl.³ G06F *15/20*

U.S. Cl. 364—510 3 Claims



1. A gas flow rate recording apparatus comprising:

transducer means located in a gas supply line which provides an electrical signal having a pulse frequency representative of the magnitude of the parameter being measured, said parameter falling into one or a range of predetermined upper and lower limits and a plurality of data storage memories, each corresponding to one specific range of said parameter limits to record the incidence of a measurement of said parameter within the respective predetermined ranges.

4,414,634

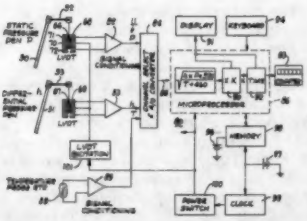
FLUID FLOW TOTALIZER

Timothy R. Louis, Berea; Carl A. Gedeon, Middleburg Heights; Maw H. Lee, Broadview Heights, and Eugene V. Erjavec, Willowick, all of Ohio, assignors to The Scott & Fetzer Company, Cleveland, Ohio

Filed Jul. 17, 1981, Ser. No. 284,526

Int. Cl.³ G06F *15/32*; G01F *1/00*

U.S. Cl. 364—510 20 Claims



9. A data totalizer for use with a fluid flow chart recorder, said chart recorder having a movable chart and a first marker to record thereon a first fluid pressure signal and a second marker to record thereon a second signal responsive to the fluid flow, and first and second motors to move the first and second markers, respectively, said data totalizer comprising, in combination:

first and second linear variable displacement transformers;

an output winding and a movable core in each transformer;

first and second means adapted to be connected to said first and second motors to move said first and second transformer cores in accordance with the static pressure and fluid flow, respectively, in a fluid flow line to establish first and second signals on the respective output winding in accordance with the static pressure and fluid flow;

electrical means responsive to the outputs of said output windings to utilize said first and second signals to perform a fluid flow rate calculation; and

means to intermittently energize said electrical calculating means.

4,414,635

METHOD AND CIRCUIT FOR RECOGNITION OF COLORS

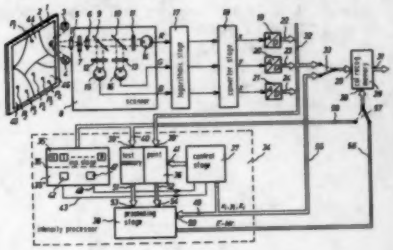
Uwe Gast, Rammsee; Eggert Jung, Schönberg; Franz Kuhn, Schönkirchen; Klaus Möllgaard, Kiel; Friedrich Redecker, Heikendorf; Ulrich Sendtko, Kiel; Rüdiger Sommer, Raisdorf; Klaus Wellendorf, and Hans-Georg Knop, both of Heikendorf, all of Fed. Rep. of Germany, assignors to Dr.-Ing. Rudolf Hell GmbH, Kiel, Fed. Rep. of Germany

Continuation of Ser. No. 98,348, Nov. 28, 1979, abandoned. This application Nov. 24, 1981, Ser. No. 324,615

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1978, 2851452; Jun. 9, 1979, 2923468; Jun. 9, 1979, 2923473; Jun. 9, 1979, 2923477

Int. Cl.³ G01J *3/50*; G06F *15/20*

U.S. Cl. 364—526 39 Claims



1. In a method of preparing for and recognizing colors on a colored image with the aid of a light source of known spectral composition, each color corresponding to a color location in a color space, each color location being defined by a color component triplet representing the spatial coordinates of said color location in said color space, and being spaced from another color location by a spatial distance, said color space including at least one spatial color range being defined by at least one of said color locations,

the steps comprising:

preparatory to color recognition

selecting in said colors of said image a number of test points, each test point having a test point color;

illuminating said image with said light source;

photoelectrically measuring the color component triplets of the selected test point colors;

defining a certain identification symbol for each selected test point color;

assigning the defined identification symbols to the color locations corresponding to respective selected test point colors;

calling up a plurality of said color locations from said color space;

determining for each called-up color location the spatial distance separating said called-up color location from the color location of each selected test point color;

selecting the color location of each test point color having the shortest distance from any of said called-up color locations respectively;

determining the identification symbols corresponding to the color locations of said test point colors having said shortest distances, respectively;

assigning said determined identification symbols to said corresponding called-up color locations, so as to form color recognition ranges around the color locations of the selected test point colors within said color space, all color locations assigned the same identification symbol forming said color recognition ranges corresponding to said color ranges, respectively; and

thereafter performing the color recognition steps of:

photo-electrically scanning said colored image point-by-point and line-by-line so as to obtain the color component triplets corresponding to each color scanned from said image;

calling up the color locations represented by said color component triplets and the identification symbols associated therewith; and

reading out said associated identification symbols, whereby the image colors are identified.

4,414,636

COLOR CONTROL SIMULATOR FOR A PICTURE REPRODUCING MACHINE

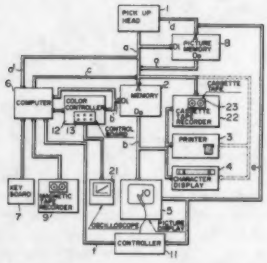
Sadao Ueda, Shiga; Isao Tokura, Uji, and Mitsuhiko Yamada, Kyoto, all of Japan, assignors to Dainippon Screen Seizo Kabushiki Kaisha, Japan

Filed Dec. 22, 1980, Ser. No. 218,669

Claims priority, application Japan, Dec. 28, 1979, 54-171134

Int. Cl.³ G03F *3/08*; H04N *1/46*

U.S. Cl. 364—526 **4 Claims**



1. A color control simulator for a picture reproducing machine comprising an input means which scans an original picture to obtain color separation picture signals, a memory storing a memory table indexed by the color separation picture signals to output first color-corrected color separation picture signals, each of which is replaceable by a second color-corrected color separation picture signal, a color control means which outputs the second color-corrected color separation picture signals to the memory when the first color-corrected color separation picture signals are replaced with a second color-corrected color separation signals, a display means which displays color corresponding to the color-corrected color separation picture signals fed from the memory, and a computer which controls the input means, the memory, the control means and the display means;

the color control means being a color controller which comprises a triangular wave generator which generates a first triangular wave having linear slopes, a function generator which reforms from the first triangular wave to a second triangular wave having curved slopes, and analog digital converters for converting the first triangular wave and the second triangular wave into the digital picture signals to obtain the color separation picture signal and the second color-corrected color separation picture signal.

4,414,637

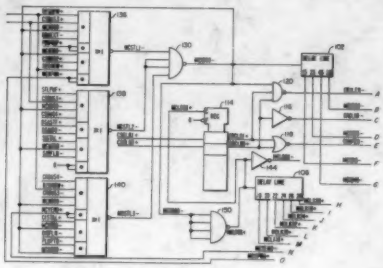
ADJUSTABLE CLOCK SYSTEM HAVING A DYNAMICALLY SELECTABLE CLOCK PERIOD

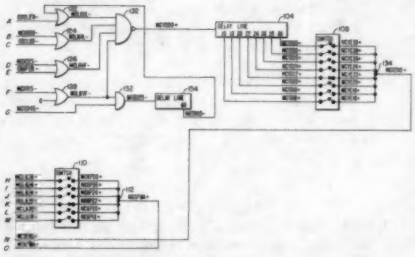
Philip E. Stanley, Westboro, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jan. 13, 1981, Ser. No. 224,727

Int. Cl.³ H03K *5/04, 5/159*

U.S. Cl. 364—569 **5 Claims**





1. A multifrequency clock system operable to produce a clock signal of a selectable clock cycle period in response to a frequency select signal, said clock signal comprising a fixed width clock pulse in a first state and a dynamically selectable width pulse in a second state, said multifrequency clock system comprising:

an inverter having an input and an output;

a first delay line having an input and an output, said input of said first delay line is connected to said output of said inverter;

a stall logic for stalling said clock system by inhibiting said clock signal from returning to said first state, said stall logic having a plurality of inputs and an output, a first input of said plurality of inputs of said stall logic is connected to said output of said first delay line, said output of said stall logic is connected to said input of said inverter;

a multitapped second delay line having an input and a plurality of outputs, said input of said multitapped second delay line is connected to said output of said stall logic;

a frequency selection logic having a plurality of inputs and an output, a first input of said plurality of inputs of said frequency selection logic for receiving said frequency select signal, a remainder of said plurality of inputs of said frequency selection logic connected to said plurality of outputs of said multitapped second delay line, said frequency selection logic for selecting among said plurality of outputs of said multitapped second delay line in response to said frequency select signal;

a multitapped third delay line having an input and a plurality of outputs, said input of said multitapped third delay line is connected to said output of said frequency selection logic; and

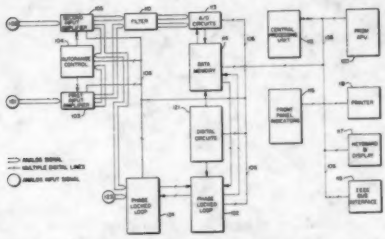
a first switch assembly having a plurality of inputs and an output, said plurality of inputs of said first switch assembly are connected to said plurality of outputs of said multitapped third delay line, said output of said first switch assembly is connected to a second input of said plurality of inputs of said stall logic whereby selection of one of said plurality of outputs of said multitapped third delay line by said first switch assembly enables adjustment of said selectable clock cycle period by adjusting the width of said dynamically selectable width pulse.

4,414,638

SAMPLING NETWORK ANALYZER WITH STORED CORRECTION OF GAIN ERRORS

Robert P. Talambiras, Springfield, N.J., assignor to Dranetz Engineering Laboratories, Inc., Edison, N.J.

Filed Apr. 30, 1981, Ser. No. 258,953
Int. Cl.³ G06J *1/00*; G06F *15/20*
U.S. Cl. 364—571 **7 Claims**



1. An improved network analyzer of the type having:

(a) first input port means, the first input port means for receiving a first analog input signal;

(b) first input amplifier means, electrically connected to the first input port means and responsive to the first analog input signal, the first input amplifier means for producing a first output signal that is related to the first analog input signal, the first input amplifier means characterized by a first midband voltage gain and a first voltage gain-vs.-frequency response;

(c) first gain control circuit means, electrically connected to the first input amplifier means, the first gain control circuit means for controlling the first midband voltage gain of the first input amplifier means to approximate one of a first set of predetermined midband voltage gains;

wherein the improvement comprises:

(d) first midband voltage gain correcting PROM means, connected to the first gain control circuit means, the first gain correcting PROM means for storing correction factors related to discrepancies between actual midband voltage gain of the first input amplifier means and each of the first set of predetermined midband voltage gains.

4,414,639

SAMPLING NETWORK ANALYZER WITH SAMPLING SYNCHRONIZATION BY MEANS OF PHASE-LOCKED LOOP

Robert P. Talambiras, Springfield, N.J., assignor to Dranetz Engineering Laboratories, Inc., Edison, N.J.

Filed Apr. 30, 1981, Ser. No. 259,013
Int. Cl.³ G06J *1/00*
U.S. Cl. 364—602 **9 Claims**

1. An improved sampling network analyzer of the type having:

(a) first sample-and-hold means for receiving a first analog signal and for producing a first sample-and-hold output signal that is a stepwise approximation to the first analog signal;

(b) analog-to-digital converter means, electrically connected to the first sample and hold means, the analog-to-digital converter means for receiving the first sample and hold output signal and for producing a discrete-time digital signal that is representative of the first sample and hold output signal;

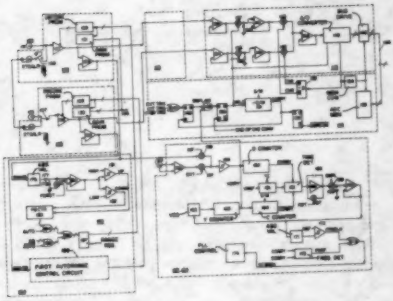
(c) synchronizing means, electrically connected to the first sample-and-hold means, the synchronizing means for receiving a reference signal, characterized by a reference signal frequency, and for synchronizing, to the reference signal, operation of the first sample-and-hold means;

wherein the synchronizing means comprises:

(d) time-difference detector means, electrically connected to a C counter means, the time difference detector means for producing a time difference detector output signal that is related to time difference between corresponding transitions of the reference signal and a C counter output signal;

(e) integrating amplifier means, electrically connected to the time difference detector means, the integrating amplifier means for receiving the time difference detector output signal and for producing a sawtooth signal that is related to an integration, with respect to time, of the time difference detector output signal;

(f) third sample-and-hold means, electrically connected to the integrating amplifier means, the third sample-and-hold



means for receiving the sawtooth signal and for producing a third sample-and-hold output signal that is related to the sawtooth signal;

(g) voltage-controlled oscillator means, electrically connected to the third sample-and-hold means, the voltage-controlled oscillator means for receiving the third sample-and-hold output signal and for producing a VCO output signal characterized by a VCO output signal frequency that is related to the third sample-and-hold output signal;

(h) Y counter means, electrically connected to the voltage-controlled oscillator means, the Y counter means for receiving the VCO output signal and for producing a Y counter output signal, the Y counter output signal characterized by a Y counter output signal frequency that is equal to the VCO output signal frequency divided by an integer factor Y;

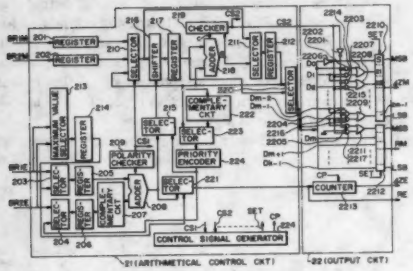
(i) C counter means, electrically connected to the Y counter means, the C counter means for receiving the Y counter output signal and for producing a C counter output signal that is characterized by a C counter output signal frequency that is equal to the Y counter output signal frequency divided by an integer factor C;

wherein the Y counter output signal serves to synchronize, to the reference signal, operation of the first sample-and-hold means.

4,414,640
ARITHMETICAL METHOD FOR DIGITAL DIFFERENTIAL ANALYZER

Shigeru Yabuuchi, Hinodemachi, and Takeyuki Endoh, Kodaira, both of Japan, assignors to Hitachi, Ltd. and Hitachi Denshi Kabushiki Kaisha, both of Tokyo, Japan

Filed Aug. 18, 1981, Ser. No. 294,061
Claims priority, application Japan, Aug. 18, 1980, 55-112739
Int. Cl.³ G06F 7/64
U.S. Cl. 364—702 8 Claims



1. In an apparatus in which a first quantity BR1, expressed in the form of a mantissa BR1M and a base two exponent BR1E, and a second quantity BR2, expressed in the form of a mantissa BR2M and a base two exponent BR2E are summed, including means for aligning the mantissae BR1M and BR2M in accordance with the relative values of the exponents BR1E and BR2E, means for summing the values of the mantissae BR1M and BR2M in a register to obtain a quantity BRM, means responsive to the value of BRM for determining a mantissa value ΔZ_M and a base two exponent value ΔZ_E of a third quantity ΔZ, where ΔZ_M is expressed in m bits and BRM is expressed k bits, and means for determining a fourth quantity R, equal to BR1+BR2−ΔZ in the form of a mantissa R_M and a base two exponent R_E, the improvement which comprises

(a) BRM register means of k bits capacity for holding the value of BRM in the form of bits designated BRM_0, BRM_1, . . . , and an overflow bit;

(b) comparing means for comparing BR1E and BR2E to determine a difference j therebetween;

(c) shift register means for shifting the value of BRM by j bits;

(d) first buffer register means of m bits capacity for holding the value of ΔZ_M in the form of bits designated S, Z_1, Z_2, . . . , Z_{m-1};

(e) second buffer register means for holding the value of R_m;

(f) R_E output means;

(g) ΔZ_E output means;

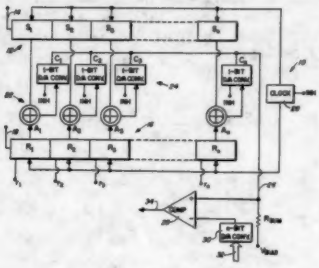
(h) checker means, for generating outputs dependent on whether the overflow bit of said BRM register means is set and on whether the contents of said BRM register means equals zero; and

(i) output circuit means for setting the values of said first buffer register means, said second buffer register mean ., said R_E output means; and said ΔZ_E output means based on the output of said checker means.

4,414,641
DIGITAL M OF N CORRELATION DEVICE HAVING INCREASED BIT RATE

Bobby R. Jarrett, Fredericksburg, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 1, 1981, Ser. No. 269,125
Int. Cl.³ G06G 7/19; G06F 15/34; H03K 13/02
U.S. Cl. 364—728 13 Claims



1. A digital correlation device for producing a voltage sum corresponding to n individual analog currents in accordance with the bits in corresponding bit positions, the n individual analog currents being indicative of the number of agreements/disagreements in the corresponding bit positions, which comprises:

a signal shift register including a plurality of signal multivibrators S_1-S_n arranged in a predetermined manner so as to store a binary sequence of signal data inputted at a signal input line of said signal shift register;

a reference shift register including a plurality of reference multivibrators R_1-R_n arranged in a predetermined manner so as to store a binary sequence of reference data inputted thereto;

a clock having one output operatively connected to said signal shift register and another output operatively connected to said reference shift register for shifting the states of the signal multivibrators S_1-S_n and the reference multivibrators R_1-R_n according to the modulation frequency of the signal data;

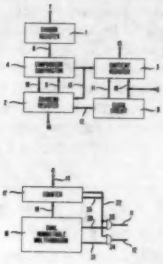
a plurality of modulo 2 adders A_1-A_n operatively connected at each of their two inputs to the outputs of corresponding signal multivibrators S_1-S_n of said signal shift register and reference multivibrators R_1-R_n of said reference shift register for modulo 2 summing of the two bits in corresponding bit positions of said signal and said reference shift registers to provide a single bit representation of the agreements/disagreements in the corresponding bit positions; and

a plurality of 1-bit digital-to-analog converters C_1-C_n operatively connected at one input to the corresponding output of each of said plurality of modulo 2 adders and at their outputs collectively to one end of a single analog summing resistor, the other end of said single analog summing resistor being connected to a voltage supply, said single summing resistor being an integral part of each one of said plurality of 1-bit digital-to-analog converters C_1-C_n so that they operate to convert the single bit representative of the agreements/disagreements of the n individual analog currents into the voltage sum.

4,414,642
APPARATUS FOR GENERATING THE INVERSE OF BINARY NUMBERS

Gerald W. Grube, Long Valley, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 9, 1981, Ser. No. 252,278
Int. Cl.³ G06F 7/52
U.S. Cl. 364—766 7 Claims



1. Apparatus for generating the inverse of a binary number comprising:

a first register means for storing the binary number to be inverted,

a second register means for initially storing a reference binary number,

a comparison means connected to the first and second register means for either determining which of the contents of the first and second register means is greater or determining whether the contents of the first and second register means are equal, responsive to signals from the first and second register means, the comparison means also either sending a remainder difference to the second register means if the contents of the second register means is greater than or equal to the contents of the first register means or not disturbing the contents of the second register means if the contents of the first register means is greater that the contents of the second register means;

a third register means connected to the comparison means for accepting and storing a one or zero received from the comparison means to form an integer scaled reciprocal of the binary number; and

clock circuit means connected to the second and third register means for alternately shifting ones or zeros in the third register means over one digital position and either shifting the contents of the second register means over one digital position or shifting a binary number received from the comparison means within the second register means until a last digital position in the reference number has been operated on.

4,414,643
ORDERING SYSTEM FOR PAIRING FEATURE INTERSECTIONS ON A SIMULATED RADAR SWEEPLINE

Jerome W. Meyer, San Jose, Calif., assignor to The Singer Company, Binghamton, N.Y.

Filed May 15, 1981, Ser. No. 263,846
Int. Cl.³ G06F 7/00
U.S. Cl. 364—900 9 Claims

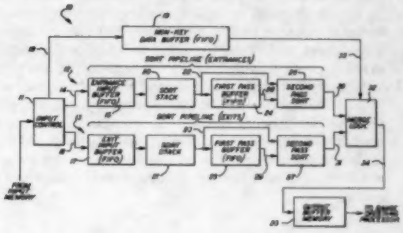
1. An ordering and pairing system for pairing feature intersections on a sweepline of a simulated radar visual display screen, regardless of shape, orientation and convexity, to arrange a variable length list of data in accordance with a desired correct order, comprising:

input data control circuit means having one input connection means to receive and to store temporarily all of said input data, and having three output connection means;

one of said three output connection means being connected to receive data that has been divided out of all said input data in accordance with a first predetermined characteristic to represent "non-key" data;

two sorting pipeline circuit means to receive "key" data that has been divided out in accordance with a second predetermined characteristic for sorting and arranging the "key" data in each of said two sorting pipeline circuit means in accordance with a desired correct relationship of ranges;

circuit means connected with one of said three output connection means from said data control circuit means to



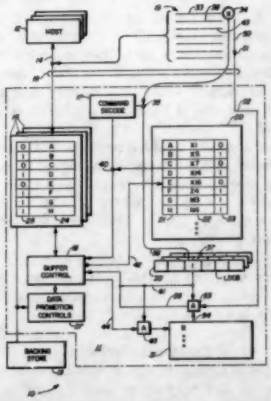
store temporarily that data divided out of all said input data which is associated with range information but which represents "non-key" data; and

merge logic circuit means having three input connections means, one for receiving "key" data from each of said two sorting pipeline circuit means and one for receiving "non-key" data associated with range data from said temporary storage circuit means, and having one output connection means for all of said input data which is now arranged and paired in accordance with said desired correct relationship of ranges.

4,414,644
METHOD AND APPARATUS FOR DISCARDING DATA FROM A BUFFER AFTER READING SUCH DATA

Gerald E. Tayler, Tucson, Ariz., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 3, 1981, Ser. No. 251,005
Int. Cl.³ G06F 9/30
U.S. Cl. 364—900 13 Claims



1. A data store system having a backing store and a cache, first means for transferring data between said cache and said backing store, second means for transferring predetermined

data between said data store system and a host, chain means for indicating an end of chained sequences of operations in said data store system,

the improvement comprising:

first means coupled to said second transferring means for receiving from a host and storing a given indication that predetermined data transferred to a host from said cache can be quickly discarded, and that other data stored in the cache and transferred to a host is not to be quickly discarded,

second means coupled to said cache for indicating data stored in said cache as being different from corresponding and supposedly identical data stored in said backing store,

third means coupled to said second transferring means for being responsive to first predetermined data being transferred from said cache to said host for effectively erasing the first predetermined data from said cache, and

fourth means coupled to said second transferring means and to said chain means for being responsive to second predetermined data being transferred from said cache to said host during a given chained sequence of operations and to said indication of said end of chained sequences for effectively erasing said second predetermined data from said cache.

4,414,645

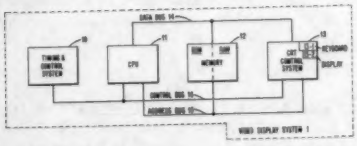
HARDWARE-FIRMWARE CRT DISPLAY LINK SYSTEM

Joseph L. Ryan, Nashua, N.H., and Gerald N. Winfrey, Billerica, Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Continuation of Ser. No. 34,832, Apr. 30, 1979, abandoned. This application Aug. 27, 1981, Ser. No. 296,932

Int. Cl.³ G06F *3/153*

U.S. Cl. 364—900 **4 Claims**



1. A hardware-firmware logic control system in a data processing system for accommodating the transfer of rows of display information of variable length stored in random order in a system memory unit to a CRT control system wherein said data processing system includes a timing control system for generating a plurality of timing signals, said memory including a random access memory (RAM) for storing each of said rows of display information and a read only memory (ROM) for storing command bytes indicative of the maximum number of characters in said each of said rows of display information, and a central processing unit (CPU), all coupled in common to a system bus, said CRT control system comprising:

(a) CRT control means coupled to said CPU and said ROM and responsive to a write command signal from said CPU for storing said command bytes received from said ROM and responsive to a start signal from said CPU for generating a direct memory access (DMA) request signal to said timing control system;

(b) DMA request logic means coupled to said CRT control means and said timing control means and responsive to the DMA request signal and a DMA cycle signal for generating a DMA acknowledge signal;

said CRT control means coupled to said RAM and responsive to the DMA acknowledge signal for receiving a plurality of data byte signals and attribute byte signals followed by link byte signals and a plurality of address byte signals indicative of said each of said rows of display information;

(c) link character decode means coupled to said RAM and said timing control system and responsive to the DMA acknowledge signal and the link byte signals for generating a link signal and a load signal;

(d) most significant byte address logic means coupled to said RAM and said link character decode means and responsive to the link signal for storing most significant byte signals representative of the most significant byte of the plurality of address byte signals; and

(e) memory address logic means coupled to said RAM and said most significant byte address logic means and responsive to the load signal for storing the most significant byte signals received from said most significant byte address logic means and least significant byte signals received from said RAM for transfer to said RAM the most significant byte signals and the least significant byte signals being indicative of an address location storing a byte representative of a first character of a next row of display information.

4,414,646

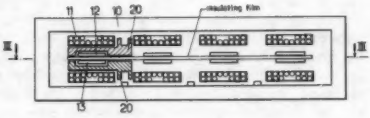
MAGNETIC BUBBLE MEMORY DEVICES

Xavier Boutin, Elancourt; Francis Compagnon, Saint-Gratien, and Michel Poirier, Eragny, all of France, assignors to Societe D'Applications Generales D/Electricite et de Mecanique Sagem, Paris, France

Filed Mar. 31, 1981, Ser. No. 249,371

Int. Cl.³ G11C *19/08*

U.S. Cl. 365—2 **12 Claims**



1. A magnetic bubble device, comprising

a common package,

at least one pair of memory chips located in said package with bubble propagation patterns in confronting relation,

means for creating, duplicating, transferring and sensing bubbles,

connecting means for connection of said means to the outside of said package,

drive means common to all said chips,

and bias magnetic field creating means common to all said chips,

and a thin sheet of electrically insulating material located in a midplane of said drive means between said chips and carrying lead connections between said chips and electrical output pins,

wherein the two chips of a same pair have bubble propagation patterns which are mirror images of each other and additionally angularly offset by 180°.

4,414,647

BUBBLE DOMAIN REPLICATOR FOR CONTIGUOUS-DISK DEVICES

William J. Kabelac, Morgan Hill, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 26, 1982, Ser. No. 352,735

Int. Cl.³ G11C *19/08*

U.S. Cl. 365—12 **7 Claims**

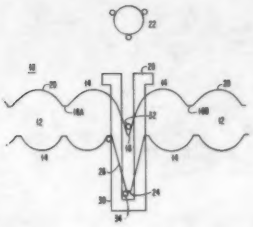
1. A bubble replicator for ion-implanted bubble devices having:

a non-implanted region having first and second sides, characterized by

a cusp portion on said first side extending substantially into the longitudinal plane of said region,

a tip portion on said second side extending substantially away from the longitudinal plane of said region, said tip

portion being in substantial alignment with said cusp portion, and



a hairpin loop conductor in overying contact with said cusp portion and said tip portion and oriented such that the closed end portion thereof is in spaced surrounding relationship with the end of said tip portion.

4,414,648

MAGNETIC BUBBLE DOMAIN SWAP GATE CIRCUIT

Takeyasu Yanase, Yokohama, Japan, assignor to Fumitsu Limited, Kawasaki, Japan

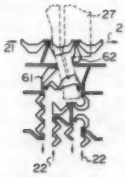
PCT No. PCT/JP80/00159, § 371 Date Mar. 17, 1981, § 102(e) Date Mar. 11, 1981, PCT Pub. No. WO81/00322, PCT Pub. Date Feb. 5, 1981

PCT Filed Jul. 16, 1980, Ser. No. 253,522

Claims priority, application Japan, Jul. 17, 1979, 54-90647

Int. Cl.³ G11C *19/08*

U.S. Cl. 365—16 **22 Claims**



1. An improved magnetic bubble domain swap gate circuit comprising of the type which connects an information transmission line for transmitting a magnetic bubble domain and an information storage loop for storing the magnetic bubble domain wherein so that the magnetic bubble domain in the information transmission line is transmitted to the information storage loop and simultaneously, the magnetic bubble domain in the information storage loop is transmitted to the information transmission line, both the information transmission line and the information storage loops being formed of patterns of magnetic substance elements, wherein the improvement comprises: said magnetic bubble domain swap gate circuit being is arranged to that the magnetic substance elements of the information transmission line are longer than the magnetic substance elements of the information storage loop; and in the information transmission line having a longer magnetic substance pattern period than the magnetic substance pattern period of the information storage loop and in the information storage loop, the following relations are established in bit length spacings:

$AB \cong CD$,

$AD = CD$ and

$AB = BC$,

wherein A represents an the outlet of the information transmission line to the information storage loop, B represents an the inlet of the information transmission line from the information storage loop, C represents an the outlet of the information storage loop to the information transmission line and D represents an the inlet of the information storage loop from the information transmission line.

4,414,649

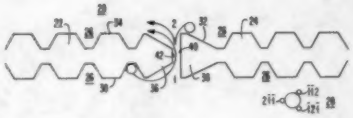
GAP TOLERANT MERGE ELEMENT FOR CONTIGUOUS-DISK BUBBLE DEVICES

Timothy J. Gallagher, Mountain View, and Kochan Ju, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 24, 1982, Ser. No. 351,814

Int. Cl.³ G11C *19/08*

U.S. Cl. 365—36 **5 Claims**



1. A merge element for ion-implanted contiguous-disk bubble devices comprising

a first bubble propagation track having a first end portion, said first portion having a first straight edge region with a first length, and

a second bubble propagation track having a second end portion, said second portion having a second straight edge region with a second length, said second length longer than said first length, said second region facing said first region to form the opposite sides of a merge channel, said first end portion and said second end portion form angles with respect to a line passing through the center of said merge channel which are asymmetric to each other and which participate in the merge function wherein said merge channel allows only unidirectional bubble propagation therethrough.

4,414,650

MAGNETO-OPTIC MEMORY ELEMENT

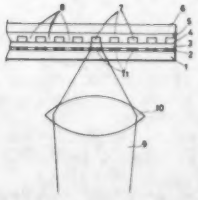
Kenji Ohta, Yao; Akira Takahashi, and Toshihisa Deguchi, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 19, 1981, Ser. No. 275,388

Claims priority, application Japan, Jun. 23, 1980, 55-85695; Jul. 23, 1980, 55-101604; May 8, 1981, 56-70284

Int. Cl.³ G11C *13/04*

U.S. Cl. 365—122 **4 Claims**



1. A magneto-optic memory medium comprising:

a reflector for reflecting light used for information reproduction;

a magneto-optic magnetization film having an axis of mag-

netization perpendicular to its surface disposed adjacent said reflector; and

means for directing light onto said magnetization film from a position on a side of said film opposite said reflector;

wherein, when light is applied for information reproduction, the light passes through said magnetization film to said reflector and is reflected by the reflector back to said magnetization film for use in information reproduction.

4,414,651

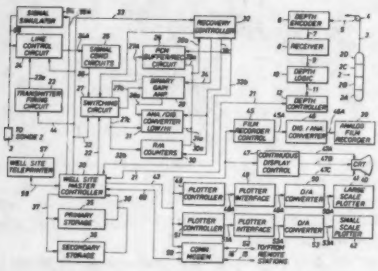
INTEGRATED WELL LOGGING SYSTEM AND METHOD

Guy O. Buckner, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Dec. 1, 1980, Ser. No. 211,882

Int. Cl.³ G01V *1/40*

U.S. Cl. 367—27 **5 Claims**



1. A method for detecting acoustic parameters from acoustic energy traversing a borehole, comprising:

introducing a pulse of acoustic energy within said borehole at a first depth;

receiving a first acoustic signature signal within said borehole in response to said pulse having first, second, third and fourth positive peaks;

deriving a plurality of first digital representations from said received signal;

determining from said first digital representations first and second compressional arrival times;

determining from said first digital representations first and second shear arrival times;

determining from said first digital representations a first, second, third and fourth amplitude corresponding to respective ones of said first, second, third and fourth peaks;

determining a third compressional arrival time at a second depth adjacent said first depth;

deriving a difference between said first and said third compressional arrival times; and

selecting a compressional arrival time as a function of said difference.

4,414,652

ULTRASONIC LINE SENSOR

Scott D. Crist, Minnetonka, Minn., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed Jun. 26, 1981, Ser. No. 277,757

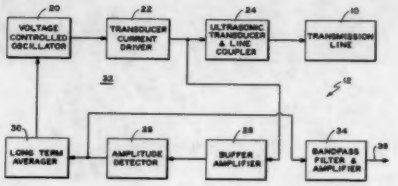
Int. Cl.³ G08B *13/22*

U.S. Cl. 367—93 **3 Claims**

1. A line sensor comprising, in combination:

an elongated transmission line for longitudinal pressure waves which change transmission characteristics with change in the length of said line due to transverse mechanical loading;

means for energizing said line with longitudinal pressure waves at a desired frequency of operation, including means for maintaining said frequency of operation at a long-term value;



and means responsive to short term changes in said frequency of operation.

4,414,653

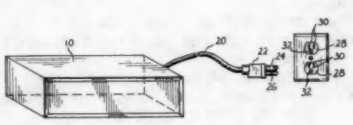
RODENT CONTROL DEVICE

Donald J. Pettinger, 2112 Meadowlane Dr., Chillicothe, Mo. 64601

Filed Jul. 22, 1982, Ser. No. 400,912

Int. Cl.³ H04B *11/00*

U.S. Cl. 367—139 **8 Claims**



1. Apparatus for repelling rodents from a building having an AC wiring system including hot and neutral lines and a ground line all connected with a receptacle, said apparatus comprising:

a housing;

at least one coil in said housing operable to generate sound waves offensive to rodents when alternately energized and deenergized at a predetermined frequency;

a plug adapted to be received by the receptacle, said plug having a pair of prongs establishing electrical connection with the hot and neutral lines and a ground prong establishing electrical connection with the ground line when the plug is received by the receptacle;

means providing an electric circuit extending between said pair of prongs, said circuit including said coil therein to effect energization of the coil when said plug is received by the receptacle and said circuit is completed;

frequency control means for alternately completing and interrupting said circuit at said predetermined frequency; and

a ground wire extending through said coil to transmit the sound waves generated by the coil, said ground wire having one end connected to the housing and an opposite end connected to said ground prong of the plug to transmit the sound waves through the ground prong to the ground line of the wiring system of the building.

4,414,654

THINNED ARRAY TRANSDUCER FOR SONAR

Eugene E. Hill; Marvin S. Scrimshaw, both of Cornwall, Canada, and Edward W. Showalter, North Hollywood, Calif., assignors to Canadian Patents and Development Limited, Ottawa, Canada

Division of Ser. No. 232,314, Feb. 6, 1981, Pat. No. 4,380,808. This application Aug. 27, 1982, Ser. No. 412,249

Int. Cl.³ G01S *15/02*

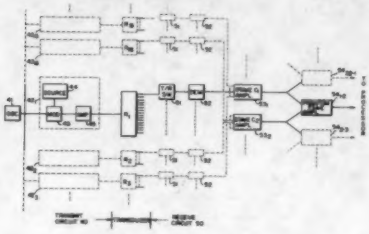
U.S. Cl. 367—103 **2 Claims**

1. A sonar transducer system for operation in a particular medium at a predetermined frequency f_o, comprising:

an array of sonar elements mounted in rows and columns on

a structure to form a checkerboard pattern wherein the spacing between adjacent elements in the rows or columns is equal to or greater than $\lambda_m/2$, where λ_m is the wavelength of the signal of frequency f_o transmitted in the medium;

transmit means for separately providing a modulated signal to each of the rows of sonar elements whereby the elements are energized and transmit a predetermined sonar beam into the medium; and



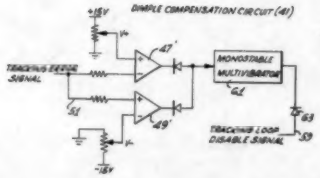
receive means for receiving signals from the sonar elements when they are not transmitting, said receive means having first means for combining the signals from the sonar elements in the columns to provide an output signal for each column; and second means for combining the output signals from every adjacent pair of columns to provide an output for each pair of columns.

4,414,655

SCANNING BEAM CONTROL SYSTEM

Robert M. Shoji, Gardena, and John S. Chudy, Long Beach, both of Calif., assignors to Discovision Associates, Costa Mesa, Calif.

Filed Mar. 31, 1981, Ser. No. 249,550
Int. Cl.³ G11B 21/10
U.S. Cl. 369—44 **14 Claims**



1. Tracking apparatus for aligning a scanning reading beam in a prescribed position relative to a selected recording track on a record medium, comprising:

means for determining the location of the reading beam relative to the selected track on the record medium, and for producing a corresponding tracking error signal;

beam steering means, responsive to the tracking error signal, for controllably positioning the reading beam in the prescribed position relative to the selected track;

means for monitoring the tracking error signal and determining when the reading beam is scanning a record medium defect of a type that causes the selected track to deviate momentarily from its normal position, and for starting a corresponding disable signal of a predetermined time duration; and

means, responsive to the disable signal, for selectively uncoupling the tracking error signal from the beam steering means, whereby the reading beam is maintained in its current position relative to the record medium for the duration of said disable signal,

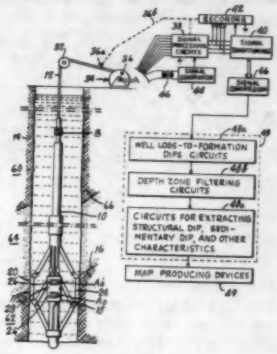
said predetermined time duration corresponding to the nominal duration of the defect being scanned by the reading beam.

4,414,656

WELL LOGGING SYSTEM FOR MAPPING STRUCTURAL AND SEDIMENTARY DIPS OF UNDERGROUND EARTH FORMATIONS

Vincent R. Hepp, Ridgefield, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Apr. 15, 1980, Ser. No. 140,578
Int. Cl.³ G01V 1/40, 1/30
U.S. Cl. 367—25 **42 Claims**


WELL LOGS-TO-FORMATION DIPS CIRCUITS
DEPTH ZONE FILTERING CIRCUITS
CIRCUITS FOR EXTRACTING STRUCTURAL DIP, SEDIMENTARY DIP, AND OTHER CHARACTERISTICS
MAP PRODUCING DEVICES

1. A well logging method of producing a map showing the structural dips of depth zones of earth formations adjacent a borehole comprising the following machine-implemented steps:

deriving formation dips at a succession of closely spaced depth levels in a borehole from well log outputs of measuring devices carried on a dipmeter tool passed through the borehole;

filtering the formation dips into a plurality of non-overlapping depth zones each encompassing a number of formation dips most, but not necessarily all of which are mutually consistent within the respective zone, wherein the depth extent of a zone is not preset, but is determined by the depth extent of the mutually consistent formation dips making up the zone;

finding, from at least selected ones of the formation dips in the respective depth zones, the respective structural dips of the respective zones; and

identifying the respective structural dips of the last recited zones, and producing respective traces on a map indicative of the last recited dips.

4,414,657

MOVING SYSTEM FOR A VIDEODISK READER-RECORDER

Louis Arquie, and Michel Thirouard, both of Paris, France, assignors to Thomson-CSF, Paris, France

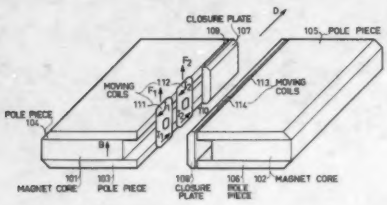
Filed Jan. 21, 1981, Ser. No. 226,905
Claims priority, application France, Jan. 24, 1980, 80 01525
Int. Cl.³ G11D 7/08
U.S. Cl. 369—45 **7 Claims**

1. A moving system for a videodisk reader-recorder of the type comprising an objective which serves to focus a light beam on a track carried by a videodisk along a first axis substantially perpendicular to the disk, a carriage adapted to support said objective and means for displacing said carriage radially with respect to said disk along a second axis so as to follow the track, wherein said moving system further comprises:

a frame for supporting the objective,

means for joining said frame to said carriage whereby said frame is permitted to carry out a first longitudinal movement with respect to the carriage along the first axis in order to maintain focusing of the light beam on the disk and to carry out a second movement of rotation with respect to said carriage about a third axis perpendicular to the first two axes in order to maintain the focal point of the light beam on the track of the disk,

magnetic field generation means having at least one magnet with two pole-pieces and one armature providing two air-gaps extending parallel to the direction of said second axis, one air-gap above the other air-gap with respect to said first axis, in which uniform magnetic fields are developed, in one direction for the upper pole-piece and in the other direction for the lower pole-piece and



at least one first pair of flat coils attached to the frame in a plane at right angles to the third axis and symmetrical with respect to the first axis, said at least one first pair of flat coils circulating within said air-gaps in order, for each coil, to force current to flow parallel to the direction of said second axis and in one direction in a portion of said coil which is located within one of said air-gaps and in the other direction in a portion of said coil which is located within the other of said air-gaps, said coils developing forces which initiate said first and said second movement when said coils carry electric currents and are placed in said magnetic fields.

4,414,658

LINEAR TRACKING ARRANGEMENT IN A PHOTOGRAPHIC DISC TYPE INFORMATION CONTAINING SYSTEM

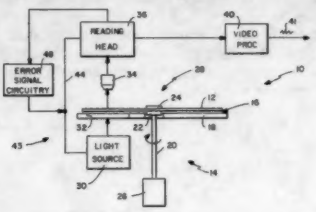
Glenn T. Yoshida, Cupertino, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

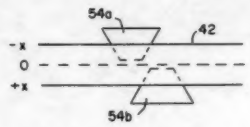
Filed Jun. 12, 1981, Ser. No. 273,235

Int. Cl.³ G11B *7/00, 21/10*

U.S. Cl. 369—46 **3 Claims**

1. In an optical system for recording information on or retrieving information from a rotating disc in which a beam of light located on one side of said disc is directed onto and across a given track of said disc, which track serves to contain said information and which, ignoring said information, is characterized by a predetermined non-uniform light transmissivity curve in its cross-direction, an arrangement for maintaining said beam and track in a fixed lateral position relative to one another as said disc rotates, even if said track moves laterally from its intended path of movement to a limited extent, said arrangement comprising circuitry including light sensitive means disposed in optical alignment with said beam on an opposite side of said disc and responsive to the light passing through said disc for producing an electrical error signal corresponding in time and substantially linearly in magnitude with limited lateral deviations of said track from its intended lateral position with respect to said light beam, said light sensitive means being configured in accordance with said curve to maintain a linear relationship between the magnitude of said error signal and said lateral track deviations, regardless of the non-uniform cross-directional transmissivity of said track; and





means responsive to said error signal and acting on said beam for minimizing said deviations.

4,414,659

METHOD AND APPARATUS FOR ENCODING DIGITAL DATA SO AS TO REDUCE THE D.C. AND LOW FREQUENCY CONTENT OF THE SIGNAL

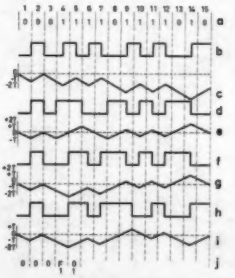
Hubertus F. M. Beckers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 4, 1981, Ser. No. 259,796

Claims priority, application Netherlands, Jun. 16, 1980, 8003476

Int. Cl.³ G11B *7/00, 5/09*

U.S. Cl. 369—59 **4 Claims**



1. A method of encoding digital data for recording on a record carrier, said data being defined by a stream of data bits of a first and second type which are encoded as signal level transitions or absence thereof in consecutive bit cells each associated with a respective one of the data bits in said stream, said method comprising the steps of:

producing a signal level transition in the middle of an associated bit cell upon occurrence of a data bit of said first type in said stream,

producing a signal level transition in the beginning of an associated bit cell upon occurrence of a data bit of the second type in said stream unless said second type data bit immediately follows a data bit of said first type in said stream, in which event no transition is produced in the bit cell associated with that second type bit, and

upon each occurence in said stream of a bit string consisting

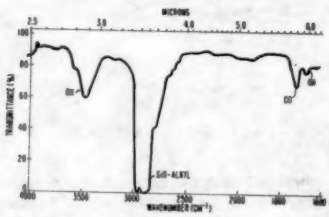
of one data bit of said second type immediately followed by only two consecutive data bits of said first type, suppressing the production of a transition in the middle of the two cells associated with said two data bits of said first type in that string and producing a transition in the beginning of the bit cell associated with the second data bit of said two data bits of said first type in that string and upon occurrence in said stream of a bit string consisting of one data bit of said second type immediately following by n consecutive data bits of said first type, where n is an even number equal to or greater than four, suppressing the production of a transition in the middle of each of the two cells associated with the first and second data bits of said first type in that string and producing a transition in the beginning of the bit cell associated with the second data bit of said first type in that string so as to reduce the d.c. component in the encoded signal.

4,414,660

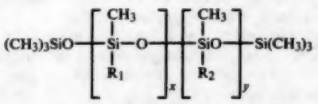
HIGH DENSITY INFORMATION DISC

Chih C. Wang, Hightstown, and Ronald F. Bates, Trenton, both of N.J., assignors to RCA Corporation, New York, N.Y.

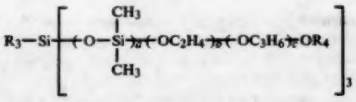
Filed Aug. 13, 1982, Ser. No. 408,021
Int. Cl.³ C07F 7/18; G11B 3/70
U.S. Cl. 369—286 **5 Claims**



1. In a high density information record adapted for use with a playback stylus to effect recovery of signals occupying a bandwidth of at least several megahertz when relative motion at a desired rate is established between said record and said stylus, said record comprising a disc of a conductive material containing an information track constituted by a surface relief pattern in said track to accommodate recovery of signals of said bandwidth upon establishment of relative motion at said rate, said record coated with a methyl alkyl siloxane lubricant having the formula



wherein R_1 and R_2 are alkyl groups of 4–20 carbon atoms, x is an integer of 2–4, y is an integer of 0–2 and wherein the sum of x plus y is 4 or less, the improvement which comprises including in said lubricant an alkylene oxide silicone copolymer of the formula



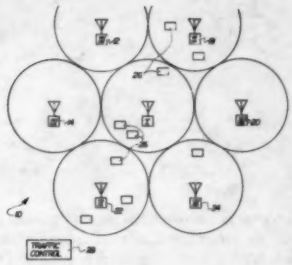
wherein R_3 and R_4 are lower alkyl, a is an integer of 1–2, b is an integer of 0–2 and c is an integer of 1–6.

4,414,661

APPARATUS FOR COMMUNICATING WITH A FLEET OF VEHICLES

Krister Karlstrom, Stockholm, Sweden, assignor to Trancom AB, Sodertalje, Sweden

Filed Jul. 2, 1981, Ser. No. 279,837
Int. Cl.³ H04J 3/02, 3/06
U.S. Cl. 370—95 **8 Claims**



1. Apparatus for use with a fleet vehicle adapted to participate in a single frequency time division multiplexed communications systems wherein each of plural participating vehicles communicates data to a central station in a respective assigned time slot of a multiple time slot, cyclically recurring communication cycle, wherein said central station transmits synchronizing information in a predetermined time slot of each communication cycle, and wherein requests by nonparticipating fleet vehicles for participation in the communication system are communicated to the central station during another predefined time slot in the communication cycle, said apparatus comprising clock means for measuring time intervals to identifying the time slots associated with said cyclically recurring communication cycle, transceiver means for receiving said synchronizing information from said central station, means for synchronizing said clock means to said cycle in accordance with said synchronizing information, and control means responsive to said clock means and actuatable to initiate participation in said communication cycle by causing said transceiver means to transmit a request for participation in said cycle to said central station a random period after the beginning of the time slot in which said requests are to be communicated, wherein said random delay has a maximum duration which is no greater than the length of said time slot.

4,414,662

SYSTEM FOR THE TRANSMISSION OF DIGITAL DATA IN PACKETS

Jean-Claude Bousquet, 97, rue des Morillons, 75015 Paris, France

Filed Mar. 24, 1981, Ser. No. 247,170
Claims priority, application France, Apr. 3, 1980, 80 07561
Int. Cl.³ H04L 4/02; H04J 3/00
U.S. Cl. 370—100 **6 Claims**

1. A system for the transmission of digital data in packets, comprising:

transmission means able to form packets comprising a preamble formed more particularly from a timing recovery bit sequence followed by a combination of bits called a single word;

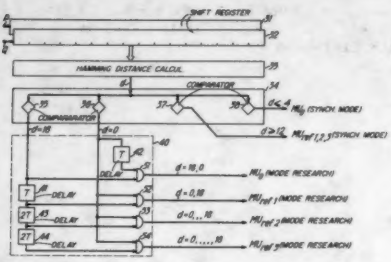
reception means more particularly comprising a decoder able to detect the presence of a single word in the signals received;

wherein:

(A) the transmission means is able to form single words taken in a group of words each having 2n bits and constituted by a word M of n bits between which are inserted the n bits of the complement word M, the bits of M being displaced relative to those of M by a number

n of ranks, the choice of p defining the single word of the group;

(B) in the reception means there is only one single word



detector and it functions with n bits, said detector being able to detect the displaced appearances of p ranks of words M and M on each bit sequence of even rank and uneven rank.

4,414,663

TIME DIVISION MULTIPLEX SYSTEM HAVING TRANSMITTED PULSES IN TIME CHANNELS DISTRIBUTED OVER AND CO-TRANSMITTED WITH A FRAME CLOCK SIGNAL COMPONENT

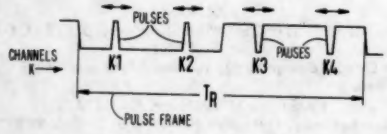
Klaus Panzer, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Nov. 5, 1980, Ser. No. 204,207

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1979, 2947770

Int. Cl.³ H04J *3/06*

U.S. Cl. 370—100 **3 Claims**



1. In a time division multiplex system having time division multiplexing of pulse modulated signals comprising pulses of identical shape and width, particularly of optically transmittable pulse phase modulation signals, the improvement therein comprising:

means for transmitting in a first half of each pulse frame, as defined by a frame clock, signals of a first portion of the time channels of a frame as pulses; and

means for transmitting in a second half of each pulse frame the signals of another portion of the time channels as pulse-shaped pauses within a signal level which corresponds to that of the signals transmitted in the first half of the pulse frame, so that a clock component is co-transmitted superimposed with said pulses without requiring a separate sync channel.

4,414,664

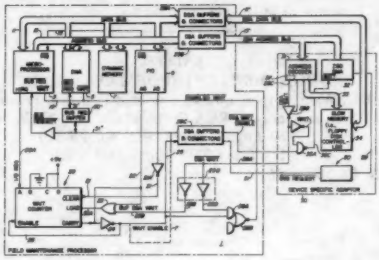
WAIT CIRCUITRY FOR INTERFACING BETWEEN FIELD MAINTENANCE PROCESSOR AND DEVICE SPECIFIC ADAPTOR CIRCUIT

Edward H. Greenwood, Phoenix, Ariz., assignor to Genrad, Inc., Concord, Mass.

Filed Feb. 23, 1981, Ser. No. 236,885

Int. Cl.³ G06F *11/22*

U.S. Cl. 371—20 **13 Claims**



1. In a system including a dynamic random access memory and a processor which automatically effects transparent refresh operations on said dynamic random access memory during execution of program instructions in order to ensure refreshing of all locations of said dynamic random access memory, said system being capable of accessing a slow memory circuit having the characteristics that it generates a first wait signal if the access time of said slow memory circuit exceeds a predetermined amount of time, the improvement comprising in combination:

(a) counting means for counting from a first count to a second count in response to said first wait signal and producing a wait enable signal if said second count is attained by said counting means;

(b) a first wait signal conductor for conducting said first wait signal from said slow memory circuit if it has been addressed by said processor, said slow memory circuit being required to generate said first wait signal if the access time of said slow memory circuit exceeds a predetermined amount of time;

(c) count initiating means coupled between said counting means and said first wait signal conductor for responding to said first wait signal to initiate said counting;

(d) interrupt signal producing means responsive to said counting means for producing an interrupt signal in response to attaining of said second count by said counting means and applying said interrupt signal to said processor; and

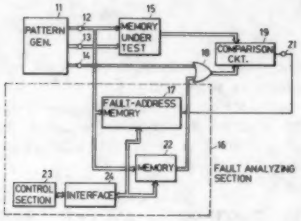
(e) enabled wait signal producing means responsive to said wait enable signal and said first wait signal for producing an enabled wait signal and applying said enabled wait signal to a wait input of said processor;

(f) said processor including means for responding to said interrupt signal by executing a wait interrupt routine resulting in refreshing of all locations of said dynamic random access memory.

4,414,665
SEMICONDUCTOR MEMORY DEVICE TEST APPARATUS

Kenji Kimura, Saitama; Shigeru Sugamori, Gyoda; Kohji Ishikawa, Funabashi, and Naoaki Narumi, Tokyo, all of Japan, assignors to Nippon Telegraph & Telephone Public Corp. and Takeda Riken Kogyo Kabushikikaisha, both of Tokyo, Japan

Filed Nov. 14, 1980, Ser. No. 206,902
Claims priority, application Japan, Nov. 21, 1979, 54-150897; Nov. 21, 1979, 54-150898
Int. Cl.³ G06F *11/26*
U.S. Cl. 371—21 **14 Claims**



1. An apparatus for testing a memory device, comprising

a pattern generator for generating and supplying test patterns to the memory device, including address patterns for accessing the addresses of the memory device,

expected value pattern generating means for providing expected data which is expected to correspond to data stored in each respective address of the memory device, in correspondence with the generation of addresses of said address patterns,

a comparison circuit for reading out the memory device, for comparing the respective data read out from the memory device and the respective expected data, and for outputting a disagreement signal when the read-out data and the expected data do not agree as defect data of the respective address of the memory device, in correspondence with the generation of addresses of said address patterns,

a fault-address memory comprising means for being accessed to read out the content of the respective address thereof, and for subsequently writing any respective defect data that is outputted from said comparison circuit into the same corresponding address, in correspondence with said generation of addresses of said address patterns,

a counter for counting the number of said defect data outputted from said comparison circuit,

means for inhibiting said counting of said counter when said output from said fault-address memory is a previously stored defect data corresponding to the same respective address of said memory device, and

fault signal generating means for generating a fault signal to stop said generation of test patterns when the number counted by said counter exceeds a predetermined value.

4,414,666
ERROR CHECKING AND CORRECTING APPARATUS

Robert D. Nelson, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Apr. 30, 1981, Ser. No. 260,158
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—37 **5 Claims**

1. A digital error detecting apparatus comprising

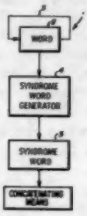
means for storing a data word containing up to N−1 bits in error where N is the number of bits in said data word; and

means responsive to said means for storing said data word for generating a unique syndrome word for each one of a plurality of possible error patterns in said data word,

wherein said unique syndrome word generating means comprises:

means for generating a first syndrome word corresponding to the location of bits in error in said data word;

means for changing the relative significance of the bits in said data word after said generating of said first syndrome word;



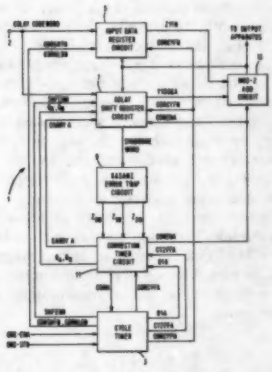
means for generating a succeeding syndrome word corresponding to the bits in error in said data word after each such change in significance; and

means for combining said first and second succeeding syndrome words in a predetermined manner.

4,414,667
FORWARD ERROR CORRECTING APPARATUS

James F. Bennett, Sudbury, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Nov. 27, 1981, Ser. No. 325,606
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—37 **13 Claims**



1. A forward error correcting apparatus for detecting and correcting errors in a half-rate Golay codeword, said codeword comprising a plurality of data bits and a plurality of check bits arranged in serial succession, said forward error correcting apparatus comprising:

input data register circuit means for receiving in succession and storing therewithin the data bits of the Golay codeword;

Golay register circuit means for receiving in succession, storing, and recirculating therewithin the data and check bits of the Golay codeword;

timer means coupled to the input data register circuit means and to the Golay register circuit means and operative to cause the data bits received by the input data register circuit means to be shifted therewithin and the data and check bits received by the Golay register circuit means to be shifted and recirculated therewithin, said timer means

being further operative following the receipt, storage, and shifting within the input data register circuit means and the Golay register circuit means of the bits of the Golay codeword to produce an error detection and correction signal of a predetermined time period during which detection and correction of an erroneous Golay codeword is to take place;

said Golay register circuit means including divider means operative as the bits of the Golay codeword are shifted and recirculated within the Golay register circuit means to divide the codeword by a predetermined generator polynomial thereby to derive a recirculating syndrome word comprising a plurality of bits;

Kasami error trap circuit means coupled to the Golay register circuit means and operative during recirculation of the syndrome word in the Golay register circuit means and during the time period of the error detection and correction signal produced by the timer means to examine the syndrome word to detect one of three possible Kasami algorithm error patterns representing the existence of errors in the associated codeword, and operative in response to detecting any one of the error patterns to produce a corresponding error signal;

modulo-2 add means coupled to the input data register circuit means and to the Golay register circuit means and arranged for performing modulo-2 addition operations on the contents of the input data register circuit means and the Golay register circuit means; and

correction timer means coupled to the Kasami error trap circuit means and to the modulo-2 add means and arranged to receive an error signal produced by the Kasami error trap means, said correction timer means being operative if the error signal corresponds to a first one of the Kasami algorithm error patterns to cause the modulo-2 add means to modulo-2 add the contents of the input data register circuit means and the Golay register circuit means and to apply the result to the input data register circuit means, and said correction timer means being operative if the aforesaid error signal corresponds to a second or third one of the Kasami algorithm error patterns to alter the contents of the Golay register circuit means at a first or second time, respectively, and to cause the modulo-2 add means to modulo-2 add the contents of the input data register circuit means and the altered contents of the Golay register circuit means and to apply the result to the input data register circuit means; and

said timer means being operative after any one of the aforesaid modulo-2 addition operations to cause the codeword bits in the input data register circuit means and the Golay register circuit means to be shifted until the termination of the error detection and correction signal produced by the timer means.

4,414,668

APPARATUS FOR REPRODUCING INFORMATION SIGNALS RECORDED ON A RECORDING MEDIUM

Yoshiki Iwasaki, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

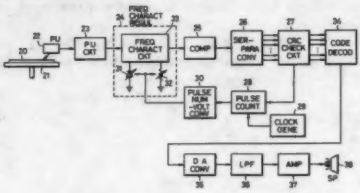
Filed Jul. 2, 1981, Ser. No. 279,819
Claims priority, application Japan, Jul. 3, 1980, 55-90020
Int. Cl.³ G06F *11/10*; H04N *5/80*
U.S. Cl. 371—38 **7 Claims**

1. An apparatus for reproducing information signals recorded on a recording medium, said apparatus comprising:

pickup means for picking up a recorded signal from the recording medium on which an analog information signal is successively recorded in units of a plurality of data blocks, each of said data blocks having a train of digital signals obtained by digitally modulating the analog information signal, error correcting words, and an error detection word;

frequency characteristic regulation means for regulating the frequency characteristic of the signal picked up from said recording medium by said pickup means;

error detection means for detecting whether an error exists in the data block of a signal which has passed through said



frequency characteristic regulation means, by use of said error detection word; and

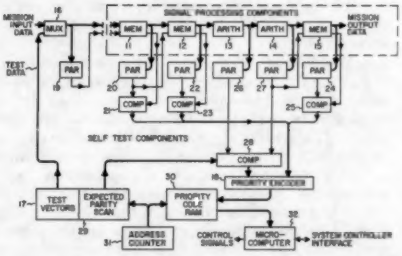
control means for controlling said frequency characteristic regulation means to vary the frequency characteristic according to an output of said error detection means.

4,414,669

SELF-TESTING PIPELINE PROCESSORS

Richard W. Heckelman, Skaneateles; Christopher E. Marchant, Baldwinsville, and Jack B. Williams, Liverpool, all of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Jul. 23, 1981, Ser. No. 286,210
Int. Cl.³ G06F *11/10*
U.S. Cl. 371—49 **10 Claims**



1. A self-testing pipeline processor comprising:

A. a plurality of concatenated deducible-parity (DP) modules processing data at a given clock rate,

(1) each module having an input for data and an input for parity, the parity being that of the input data,

(2) each module propagating said data and said parity in a common path to an output at which said data and said parity are separately available in performing the same function on said parity as that performed on said data,

(3) a parity encoder associated with each module to which the module output data is applied for parity encoding, and

(4) a comparator electrically associated with each module to which the input parity propagated in said module and the parity of the module output data are applied to form comparison values at said clock rate, each non-comparison being indicative of a possible fault in said module,

B. a priority encoder having a plurality of priority ordered inputs and producing a malfunction code at said clock rate identifying the highest priority input at which each non-comparison is produced,

the priority ordered encoder inputs being connected to the comparator outputs in the order of the associated modules' positions in the processor giving each module a

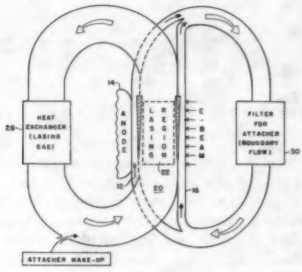
unique priority code, the most upstream module having the highest priority code, and

C. a memory means coupled to said priority encoder for storing the malfunction codes at said clock rate to identify the highest priority module associated with each error as a quantity of data is processed.

4,414,670
E-BEAM MAINTAINED PLASMA DISCHARGE ELECRODES

Rudolf Limpaecher, Topsfield, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, 06, D.C.

Filed Sep. 29, 1981, Ser. No. 306,843
Int. Cl.³ H01S *3/22*
U.S. Cl. 372—58 **8 Claims**



1. In a flowing gas laser which includes opposite anode and cathode electrodes, the improvement which comprises:

(a) an anode electrode flowing gas layer;

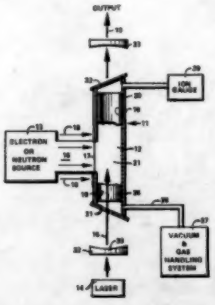
(b) a cathode electrode flowing gas layer; and

(c) an intermediate flowing gas layer forming a lasing medium, located between said anode and cathode electrode flowing gas layers and having a composition which differs from that of said anode and cathode flowing gas layers.

4,414,671
COLLISION LASER

William E. Wells, Jr.; S. Douglas Marcum, both of Oxford; Lawrence W. Downes, Fairfield, all of Ohio, and Richard A. Tilton, San Diego, Calif., assignors to Miami University, Oxford, Ohio

Filed Oct. 5, 1981, Ser. No. 308,714
Int. Cl.³ H01S *3/09*
U.S. Cl. 372—73 **33 Claims**



1. Apparatus for providing stimulated emission of electromagnetic radiation, comprising

means for containing a mixture including a first gas, in the X(1) state, and a second gas, in the Y(1) state;

means for pumping the first gas to excite a high population density of its atoms or molecules from the X(1) state to the X(2) state; and

means for injecting photons of suitable frequency into the mixture, to excite, via a three-body radiative collision of an atom or a molecule of X(2) with a molecule of Y(1) and a photon,

a high population density of molecules of the second gas from the Y(1) state to the Y(3) state, followed by

a substantially simultaneous return of a substantial portion of the excited first gas atoms or molecules to the X(1) state and a substantial depopulation of the Y(3) state of the second gas, causing the molecules thereof to drop to the lower energy Y(2) state,

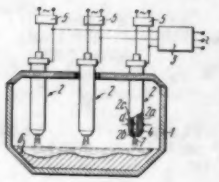
thereby stimulating the emission from the second gas of two photons at the same wavelength for each absorbed photon, and thus providing a total quantity of photon emission with sufficient gain for amplification of electromagnetic radiation, and

finally resulting in the depopulation of the molecules in the Y(2) state by autoionization.

4,414,672
PLASMA-ARC FURNACE

Boris E. Paton; Jury V. Latash; Oleg S. Zabarilo; Gary A. Melnik; Nikolai I. Zamulo; Anatoly A. Zhdanovsky; Alfred I. Bukalo; Vladimir V. Goncharenko; Stanislav S. Ivanchenko; Anatoly R. Slobodian, all of Kiev; Sergei P. Bakumenko, and Mikhail K. Zakamarkin, both of Izhevsk, all of U.S.S.R., assignors to Institut Elektrosvarki Imeni E. O. Patona Akademii Nauk Ukrainskoi SSR, Kiev, U.S.S.R.

Filed Sep. 15, 1981, Ser. No. 302,690
Int. Cl.³ H05B *7/00*; H05H *1/00*
U.S. Cl. 373—22 **1 Claim**



1. A plasma-arc furnace comprising:

a casing, and

a plurality of plasma torches, each comprising

a body provided with a nozzle and an axial conduit for feeding a plasma-forming gas, and

a cylindrical electrode for connection to a three-phase power supply, said electrode being disposed within said conduit of said body; and being mounted within said casing in symmetrical relationship relative to the vertical axis thereof so that the distance between the centers of working ends of said plurality of electrodes of adjacent said torches is not more than 15 diameters of said electrode.

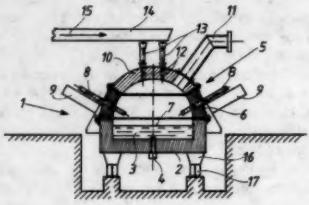
4,414,673
PLASMA MELTING FURNACE

Walter Lugscheider, Linz, and Ernst Riegler, Enns, both of Austria, assignors to Voest-Alpine Aktiengesellschft, Linz, Austria

Filed Jun. 21, 1982, Ser. No. 390,331
Claims priority, application Austria, Jul. 15, 1981, 3116/81
Int. Cl.³ H05B *7/00*
U.S. Cl. 373—22 **6 Claims**

1. In a plasma melting furnace of the type including a fur-

nace body defined by a bottom and a furnace wall and accommodating a melt, a covering cap, at least one electrode penetrating said bottom of said furnace body, and at least three plasma burners penetrating said furnace wall or said covering cap and arranged so as to be inclined towards said bottom, said at least three plasma burners being adapted to emit direct plasma jets onto said melt, the improvement comprising charging openings having vertical axes and being provided in said covering cap for continuously melting small-sized material, such as light scrap and iron sponge, and wherein a plane is laid through the angular symmetry of the normal projections of the



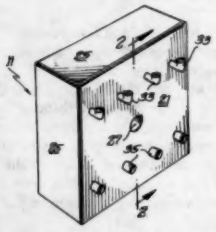
axes of two neighboring plasma burners, and two vertical planes each extend perpendicular to the normal projections of the axes of each of said at least three plasma burners, the first of said two vertical planes being laid through the impact points of said direct plasma jets on the melt and the second of said two vertical planes extending parallel to the first one at a distance of a third of the projection length of said direct plasma jets from their exit out of said plasma burners as far as to their impact points, said vertical axes of said charging openings extending in said plane laid through the angular symmetry of the normal projections of the axes of two neighboring plasma burners and between said two vertical planes.

4,414,674

ELECTRIC FURNACE THERMAL-INSULATING MODULE

Richard K. Woodruff, West Dundee, and Joseph P. Tedesco, Oak Lawn, both of Ill., assignors to Refractory Products Co., Elgin, Ill.

Filed Aug. 3, 1981, Ser. No. 289,811
Int. Cl.³ F27D *1/00*; E04B *1/80*
U.S. Cl. 373—130 **5 Claims**



1. A thermal-insulating panel for use in an electric furnace, which panel comprises

a refractory fiber mat, formed of discrete refractory fibers being interconnected and bonded together by an inorganic bonding agent, having a hot face, a cold face and a plurality of side faces and

a plurality of individual ceramic supports partially embedded in said mat and partially protruding outward from said hot face thereof, the embedded portions being shaped with an intermediate section of reduced dimension so as to be firmly anchored by said interconnected fibers of said fibrous mat which are rigidly interconnected to one another at their points of contact by said inorganic bonding agent to create a rigid fiber mat,

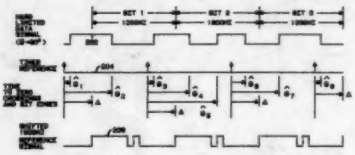
said ceramic support protruding portions being shaped to support an electrical resistance heating ribbon in the interior of the furnace generally adjacent said hot face.

4,414,675

MSK AND OK-QPSK SIGNAL DEMODULATOR

Richard A. Comroe, East Dundee, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 5, 1981, Ser. No. 290,276
Int. Cl.³ H04L *27/10, 27/18*
U.S. Cl. 375—90 **30 Claims**



1. A method of recovering phase states of a signal carrying binary data at a predetermined bit rate and for each bit consisting of one of two signalling tones having successive zero crossings, the frequency difference between the two signalling tones being one-half of the bit rate, and the phase of the data signal being continuous at the boundaries between bits, said method comprising the steps of:

extracting at discrete times coinciding with zero crossings of the data signal a phase shift signal at said discrete times, a clock offset signal indicating the position of bit boundaries and a phase intercept signal indicating the phase of the data signal at the bit boundaries; and

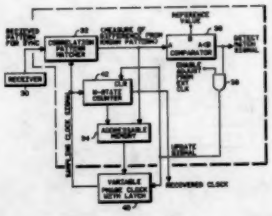
detecting at one of said discrete times during each bit one of two phase states, a first phase state detected when the phase shift signal at said one discrete time is substantially equal to the phase intercept signal, and a second phase state detected when the phase shift signal at said one discrete time is substantially equal to the phase intercept signal shifted by 180°.

4,414,676

SIGNAL SYNCHRONIZATION SYSTEM

Douglas R. Kraul, Sunrise, Fla., and James W. Marshall, State College, Pa., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 31, 1981, Ser. No. 249,512
Int. Cl.³ H04L *7/00*
U.S. Cl. 375—116 **16 Claims**



1. A signal synchronization system comprising:

means for providing first and second signals for comparative evaluation;

pattern analyzing means receiving said first and second signals and producing a control signal in response thereto,

said control signal being related to the dissimilarity between said first and second signals;

timing means producing repetitive timing signals;

local signal means producing output signals; and

adjustment means coupled to said local signal means and responsive to said control signal from said pattern analyzing means and to said timing signals from said timing means, for advancing or retarding the time occurrence of said output signals of said local signal means, be incrementally applying predetermined values as a function of the magnitude of said control signal and a discrete serial timing interval formed said timing signals.

4,414,677

SYNCHRONIZATION WORD EXTRACTOR

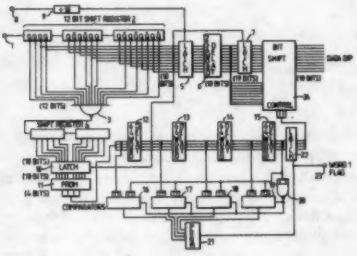
John G. S. Ive, London, and Alan C. Thirlwall, Winchester, both of England, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 2, 1981, Ser. No. 317,179

Claims priority, application United Kingdom, Nov. 18, 1980, 8036935

Int. Cl.³ H04L 7/08

U.S. Cl. 375—116 13 Claims



1. Apparatus for extracting synchronizing information from an incoming serial-bit digital signal, said signal forming a sequence of data blocks each of which has N n-bit words and a predetermined serial group of m bits forming said synchronizing information, said synchronizing information identifying each block of data, the apparatus comprising:

a first shift register arrangement including a first m-stage shift register through which said incoming digital signal is stepped at the bit rate of said incoming digital signal, said first shift register arrangement supplying a pulse when said first shift register holds said predetermined serial group of m bits;

means to derive from said incoming digital signal a word rate clock pulse signal;

a second shift register arrangement including a second n-stage shift register through which each pulse supplied by said first shift register is stepped at the bit rate of said incoming digital signal, and latch means synchronized with said word rate clock pulse signal to derive n-bit phase words, the bits of which correspond respectively to the conditions of the n stages of said second shift register;

comparator means for effectively comparing each phase word with at least one other phase word delayed by N word periods or a integral multiple of N word periods of an earlier incoming digital signal;

said comparator means supplying a control signal only when at least one of said comparisons indicates two phase words which are identical and both contain a bit corresponding to a said pulse, the position of said bit in said phase words indicating the phasing of said word rate clock pulse signal relative to the words of said incoming digital signals; and

means to de-serialize said incoming digital signal into parallel-bit n-bit words under control of said control signal.

4,414,678

ELECTRONIC UP-DOWN CONTING SYSTEM WITH DIRECTIONAL DISCRIMINATOR

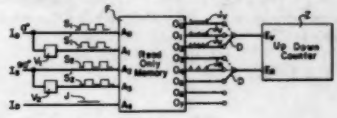
Alfons Baumgartner, Grassau, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Continuation of Ser. No. 735,105, Oct. 22, 1976, abandoned. This application Aug. 19, 1980, Ser. No. 179,433

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1975, 2547885

Int. Cl.³ H04B 3/04; H03K 9/06

U.S. Cl. 377—28 17 Claims



1. An electronic up-down counting apparatus arranged to respond to a pulse input representative of measurement information, the pulse input being in the form of two first pulse trains which have substantially identical repetition rates but are phase shifted relative to one another so as to indicate a direction of counting to be effected, said counting apparatus comprising:

means, responsive to the two first pulse trains, for generating two second pulse trains, each of which corresponds to but is out of phase to a slight degree with a respective one of the two first pulse trains, said generating means effective to create a respective selected phase shift between each of the second pulse trains and the respective corresponding first pulse train, which selected phase shifts are less than the phase shift between the two first pulse trains;

a programmed, fixed storage memory device having at least four address input terminals, each of which is connected to a respective one of the first and second pulse trains, and a plurality of output terminals, said memory device programmed to produce output pulse signals on the output terminals in response to the first and second pulse trains, which output pulse signals are representative of the pulse input and the direction of counting; and

an up-down counter coupled to the output terminals of the memory device to receive and count, in a direction determined by said memory device, a train of output pulses included in the output pulse signals.

4,414,679

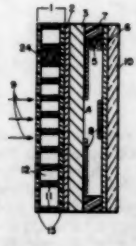
X-RAY SENSITIVE ELECTROPHORETIC IMAGERS

Richard B. Liebert, Ridgefield, Conn., and Johan W. Haarman, Eindhoven, Netherlands, assignors to North American Philips Corporation, New York, N.Y.

Filed Mar. 1, 1982, Ser. No. 353,557

Int. Cl.³ H01J 31/49, 31/50; G03G 13/00; G21K 1/00

U.S. Cl. 378—29 18 Claims



1. In an X-ray sensitive structure including an X-ray sensi-

tive material supported by a substrate-type material, the improvement comprising said substrate-type material being a pair of X-ray transparent supports separated at a distance, and a grid-type structure sandwiched between said supports, wherein spaces between said grid type structure are filled with a foamed-in-place material.

4,414,680

SELF SUPPORTING OPTICAL DIFFRACTION GRID

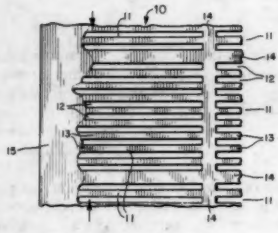
Heinz Kraus, Traunreut, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Sep. 21, 1981, Ser. No. 304,082

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1980, 3041067

Int. Cl.³ G01M *23/20*

U.S. Cl. 378—84 **20 Claims**



1. A self supporting optical diffraction grid for short wavelength electromagnetic radiation, said grid comprising:
- a peripheral frame;
- a grid foil secured to the frame, said grid foil defining a plurality of elongated slits;
- a supporting net, large meshed with respect to the grid constant of the grid foil, secured to the frame to support the grid foil; and
- at least one edge of the frame adjacent the grid foil defining a nonrectilinear pattern.

4,414,681

ROTARY ANODE X-RAY TUBE

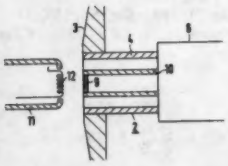
Gerd Seifert, Spardorf, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich

Filed Nov. 12, 1981, Ser. No. 320,734

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1980, 3043670

Int. Cl.³ H01J *35/04*

U.S. Cl. 378—144 **4 Claims**



1. A rotary anode x-ray tube comprising an anode assembly (2), mounted magnetically without contact, and including a rotary anode part (3) rotating with the anode assembly, and means for carrying off the anode current, characterized in that, on the rotary anode part (3), rotating with the anode assembly (2), at least one auxiliary cathode (9) is arranged as part of said means, said means further comprising a stationary auxiliary anode (11) operatively associated with said auxiliary cathode (9), and that the auxiliary cathode (9) is an oxide cathode which is centrically arranged on the anode assembly (2), a stationary heater (12, 12a, 14, 15) being disposed opposite said auxiliary cathode for supplying heat thereto.

4,414,682

PENETRATING RADIANT ENERGY IMAGING SYSTEM WITH MULTIPLE RESOLUTION

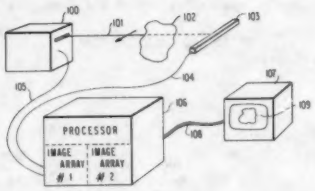
Martin Annis, and Jay A. Stein, both of Newton, Mass., assignors to American Science and Engineering, Inc., Cambridge, Mass.

Filed Nov. 17, 1980, Ser. No. 207,492

The portion of the term of this patent subsequent to Dec. 28, 2000, has been disclaimed.

Int. Cl.³ G03B *41/16*

U.S. Cl. 378—146 **10 Claims**



1. A penetrating radiant energy imaging system comprising:
- a source of penetrating radiant energy,
- sweeping means for forming a pencil beam of penetrating radiant energy for repeatedly sweeping said pencil beam across a detector field; beam cross-section control means to control the cross-section of said pencil beam between at least a first smaller cross-section and a second larger cross-section in a fixed pattern, as said beam illuminates an object,
- detector means located at the detector field for generating signals related to the intensity of said beam impinging on said detector means,
- processor means responsive to said signals from said detector means for separately identifying sets of signals produced by beams of different cross-section and for developing from said signals an image array corresponding to each of said pencil beams of different cross-section,
- whereby an image array is developed for each pencil beam cross-section,
- display means for developing an image in response to said processor means, and
- amplifying means for relatively amplifying signals produced by said beam of smaller cross-section with respect to signals produced by said beam of larger cross-section.

4,414,683

FILM HOLDER SUPPORT APPARATUS

David R. Robinson, 8840 Nedonna Beach Rd., Rockaway, Oreg. 97136

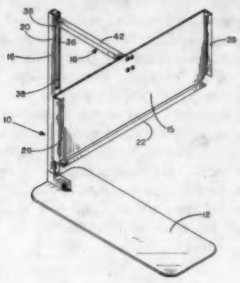
Filed Mar. 26, 1981, Ser. No. 248,014

Int. Cl.³ G03B *41/16*

U.S. Cl. 378—177 **3 Claims**

1. An apparatus for placement of film relative to a patient lying on a bed having a frame which supports a compressible mattress, said apparatus comprising:
- (a) a base for supporting the apparatus, said base being arranged to allow placement thereof between the bed frame and the mattress;

(b) film holder means for positioning film above the mattress adjacent to the patient; and



(c) means for compressing the mattress between said film holder and said base and thereby making said film holder immovable relative to said mattress.

4,414,684

METHOD AND APPARATUS FOR PERFORMING A COMPARISON OF GIVEN PATTERNS, IN PARTICULAR FINGERPRINTS

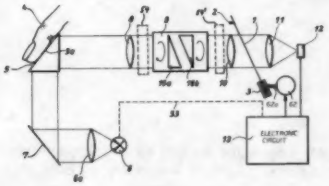
Alain Blonder, Lyons, France, assignor to Interlock Sicherheitssysteme GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 24, 1980, Ser. No. 219,802

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1979, 2952402; May 19, 1980, 3018998; Nov. 28, 1980, 3044881

Int. Cl.³ G06K *9/00*

U.S. Cl. 382—4 **60 Claims**



1. A method of comparing a first fingerprint pattern with a second fingerprint pattern formed by a recorded representation which comprises positioning said first and second fingerprint patterns relative to each other,

directing a light beam from a lamp onto said first fingerprint pattern which light beam is reflected thereby,

scanning said reflected light beam directed from said first fingerprint pattern by use of a rotatable double wedge prism scanner,

including first and second spaced wedge prisms while rotating said first wedge prism at a rotational speed different from said second wedge prism,

superimposing said scanned light beam onto said second fingerprint pattern,

directing said light beam from said second fingerprint pattern onto a photoelectric conversion means to produce an electrical output signal including an identification pulse,

directing said electrical output signal into an electronic evaluation device,

comparing said electrical output signal with an adjustable threshold value,

prior to threshold comparison, preparing and discriminating said electrical output signal by which an identification pulse resulting in an event of identity between said first and second fingerprint patterns is compared with at least one further electrical variable contained in said electrical output signal,

relating said further electrical variable with said identification pulse and summing said compared identification pulse during a performance of a plurality of test criteria,

producing at least one further signal derived from peripheral conditions during said comparison and comparing said derived signal in terms of a threshold value,

whereby said identification pulse and said signal derived from peripheral conditions are utilized in an overall determination of matching said first and second fingerprints.

4,414,685

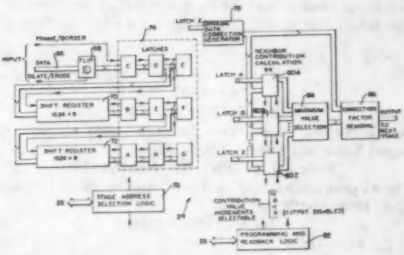
METHOD AND APPARATUS FOR PATTERN RECOGNITION AND DETECTION

Stanley R. Sternberg, 1606 Hillridge, Ann Arbor, Mich. 48103

Division of Ser. No. 73,818, Sep. 10, 1979, Pat. No. 4,322,716, which is a continuation-in-part of Ser. No. 919,171, Jun. 26, 1978, Pat. No. 4,174,514, which is a continuation-in-part of Ser. No. 742,127, Nov. 15, 1976, Pat. No. 4,167,728. This application May 29, 1981, Ser. No. 268,608

Int. Cl.³ G06K *9/00*

U.S. Cl. 382—49 **27 Claims**



1. A method of detecting patterns in an image consisting of a matrix of multivalued digital data signals, said method comprising:

(a) electronically eroding the image matrix with a structuring element of a particular configuration to form a first transformation matrix;

(b) electronically dilating the first transformation matrix by the same structuring element used in step (a) to form a second transformation matrix; and

(c) comparing said first and second transformation matrices to detect patterns in the original image matrix.

4,414,686

COMPENSATION OF NONLINEARITIES OF TRANSMISSION MEMBERS IN A RADIO RELAY SYSTEM

Sigmund Lenz, Aspach, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 31, 1982, Ser. No. 363,949

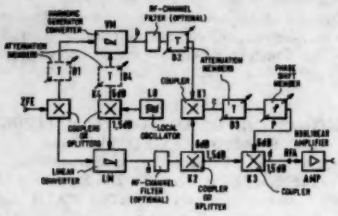
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1981, 3113005

Int. Cl.³ H04B *7/14, 1/10, 1/26*

U.S. Cl. 455—20 **14 Claims**

1. In a method for compensating nonlinearities of a transmission member of a radio relay transmission system by means of a linear converter having a linear gain characteristic and a harmonic generator converter having a nonlinear gain characteristic, which method includes supplying an intermediate frequency signal modulated with a useful signal and a local oscillator signal to respective inputs of each converter to cause each converter to produce a radio frequency output signal, and linking the output signals of the two converters together in a network, the improvement comprising: setting the operating

point of the harmonic generator converter in a manner to cause its output signal to be essentially composed of components corresponding to the useful signal and to third order intermodulation products thereof; modifying the harmonic generator converter output signal by substantially suppressing the useful signal component from that output signal and setting the amplitude of the remaining third order intermodulation products



component of that output signal; setting a relative phase position between the modified output signal of the harmonic generator converter and the output signal of the linear converter; and combining the modified output signal of the harmonic generator converter and the output signal of the linear converter subsequent to said step of setting a relative phase position.

4,414,687

RADIO RECEIVER

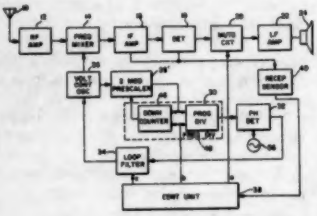
Seiichiro Hirata, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 29, 1981, Ser. No. 288,199

Claims priority, application Japan, Aug. 4, 1980, 55-108564; Aug. 4, 1980, 55-108565

Int. Cl.³ H04B *1/26*

U.S. Cl. 455—165 **3 Claims**



1. A radio receiver for selectively receiving a common broadcast program from at least first and second broadcasting stations which are transmitting said common broadcast program at different frequencies, said receiver comprising: a tuner and a local oscillator circuit having a phase locked loop including a voltage controlled oscillator coupled to said tuner, a prescaler having a frequency division ratio which is changeable from one first value to another second value, said prescaler frequency-dividing an oscillator output signal from said voltage controlled oscillator, a first frequency dividing means having a settable frequency division ratio, said first frequency dividing means frequency-dividing an output signal from said prescaler which has been frequency divided at said first value of said prescaler frequency division ratio so as to change said frequency division ratio of said prescaler by a frequency divided output from said first frequency dividing means, a second frequency dividing means having a settable frequency division ratio, said second frequency dividing means frequency-dividing an output from said prescaler which has been frequency divided at said first and second values of said prescaler frequency division ratio, a phase detector for receiving a reference signal and an output signal from said second frequency dividing means, and a loop filter for feeding an output signal from said phase detector to said voltage controlled oscillator for use as a control voltage for said voltage controlled oscillator, a control means coupled to said local oscillator circuit for tuning said tuner to the frequency of said second broadcasting station for a relatively short time interval during the reception of signal from said first broadcasting station, a level comparison means for comparing a first reception level of said signal when tuner is tuned to the frequency of said first broadcasting station with a second reception level of a signal when said tuner is tuned to the frequency of said second broadcasting station, wherein said control means is responsive to an output of said level comparison means to change the tuning of said tuner so as to be tuned to the frequency of the one of said first and second broadcasting stations having the higher corresponding reception level.

4,414,688

RF-INPUT STAGE

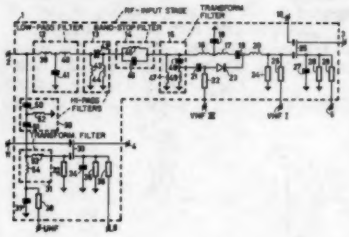
Johannes H. Hendriks, and Johannes J. M. Van Daal, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 7, 1981, Ser. No. 309,311

Claims priority, application Netherlands, Nov. 6, 1980, 8006059

Int. Cl.³ H04B *1/16*

U.S. Cl. 455—188 **8 Claims**



1. An RF input stage for TV receivers, comprising a field effect transistor in grounded source circuit configuration, the gate electrode of which is connected to an aerial input via a frequency-dependent coupling network and to ground via a resistor, characterized in that the resistor has a value at which, on the one hand, the frequency dependent coupling network is terminated with a limited reflection factor when the aerial input of the RF input stage responds to an incoming signal and, on the other hand, the resistor forms, in conjunction with the output impedance of the frequency-dependent coupling network, an impedance which is substantially equal to a signal source impedance for said field effect transistor at which the noise contribution of the field effect transistor is at its minimum, which frequency-dependent coupling network comprises a bandpass filter having a bandwidth which comprises at least one standardized TV-frequency band.

4,414,689

SQUELCH CIRCUIT

Eugene S. Enderson, Robins, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 271,767, Jun. 9, 1981, abandoned. This application Dec. 27, 1982, Ser. No. 453,647

Int. Cl.³ H04B *1/10*

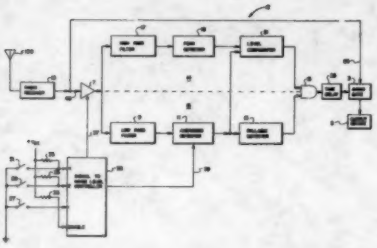
U.S. Cl. 455—221 **5 Claims**

1. A squelch circuit for a radio receiver comprising:

a low pass channel means for receiving a demodulated signal from the radio receiver including, a low frequency bandpass filter means for passing only signals with a first prede-

termined bandwidth and center frequency to provide a first filtered signal, averaging detector means for obtaining the average of the energy in the first filtered signal and to provide an average signal thereby, and syllabic detector means for detecting in the average signal, the presence of speech in the demodulated signal and to provide an indicator signal if speech is detected in the demodulated signal;

a high pass channel means for receiving the demodulated signal from the radio receiver including, a a high frequency bandpass filter means for passing only signals with



a second predetermined bandwidth and center frequency to provide a second filtered signal therefrom, a peak detector means for detecting concentration of energy and to provide a peak signal therefrom, and a level comparator means for comparing the average signal with the peak signal and to provide a positive signal when the average signal is larger than the peak signal; and

an AND gate means for ANDing the indicator signal with the positive signal and to provide an activate signal therefrom.

4,414,690

ACTIVE AERIAL

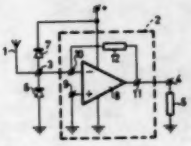
Ernst H. Nordholt, Bleiswijk, and Durk Van Willigen, Reeuwijk, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 15, 1981, Ser. No. 273,796

Claims priority, application Netherlands, Jun. 20, 1980, 8003566

Int. Cl.³ H04B *1/10, 1/18;* H03F *1/36;* H01Q *1/26*

U.S. Cl. 455—283 **6 Claims**



1. An active aerial including an aerial element having a length which is small with respect to the wavelength associated with the operating frequency and an amplifier to which the aerial element is connected, characterized in that said amplifier comprises an active element having a grounded input and a control input to which said aerial element is coupled, means for coupling to said control input to provide a voltage potential at said control input at virtually the same potential as said grounded input.

DESIGN PATENTS

GRANTED NOV. 8, 1983

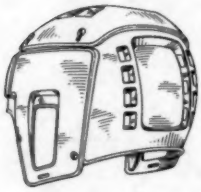
ERRATA

For CLASS	See PATENT NO.
D23–055	271,340

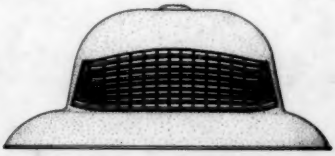
DESIGNS

NOVEMBER 8, 1983

271,249
HOCKEY HELMET OR SIMILAR ARTICLE
Charles R. Farquharson, Toronto, Canada, assignor to Amer Sport International Inc., Lachine, Canada
Filed Jan. 18, 1982, Ser. No. 340,265
Term of patent 14 years
Int. Cl. D02—*03*
U.S. Cl. D2—232

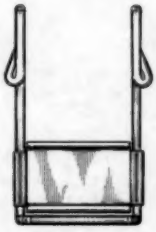


271,250
VENTILATED HAT
Ralph C. Burgin, West Point, Iowa, and David B. Cale, Hamilton, Ill., assignors to Dadant & Sons, Inc., Hamilton, Ill.
Filed Nov. 16, 1981, Ser. No. 321,875
Term of patent 14 years
Int. Cl. D02—*03*
U.S. Cl. D2—257



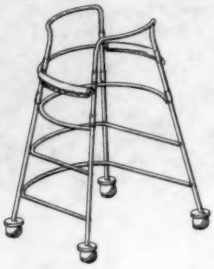
271,251
OUTSOLE FOR ATHLETIC SHOE
Edward J. Norton, Kingston, N.H., assignor to New Balance Athletic Shoe, Inc., Boston, Mass.
Filed Jun. 10, 1981, Ser. No. 272,106
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—320

271,252
BELT ATTACHED TOOL HANGER
Jack R. Sickler, P.O. Box 20803, Billings, Mont. 59104
Filed Jul. 21, 1980, Ser. No. 170,530
Term of patent 14 years
Int. Cl. D2—*99*
U.S. Cl. D2—400



271,253
TOOL POUCH
Paul Abatie, 16409 Boyle Ave., Fontana, Calif. 92335
Filed Oct. 16, 1981, Ser. No. 312,291
Term of patent 14 years
Int. Cl. D02—*07*
U.S. Cl. D2—400

271,254
WALKER
Arthur R. Morris, 80 S.1000 E., Zionsville, Ind. 46077
Filed Nov. 21, 1980, Ser. No. 208,852
Term of patent 14 years
Int. Cl. D3—*03*
U.S. Cl. D3—5

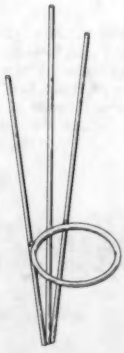


271,255
KEY RING
Jean-Pierre M. Rousseau, 98, rue de Miromesnil, 75008 Paris, France
Filed Jan. 6, 1981, Ser. No. 222,831
Claims priority, application France, Jul. 15, 1980, 80 2286
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—61

271,256
STEP STOOL
Donald R. McClelland, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Jul. 20, 1981, Ser. No. 285,395
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—32

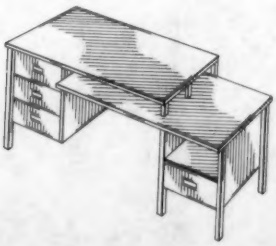
271,257
CHAIR
Giovanni Offredi, Milan, Italy, assignor to Fratelli Saporiti, Besnate, Italy
Filed Apr. 13, 1981, Ser. No. 253,230
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—47

271,258
PLANT HANGER
Zoltan B. Gyebnar, 2340 Starr Ave., #3, Oregon, Ohio 43616
Filed Sep. 3, 1981, Ser. No. 299,050
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—137

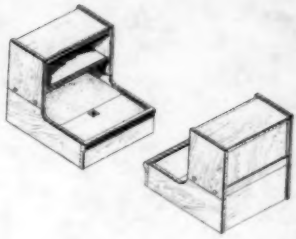


271,259
BUFFET
Melbourne F. Smith, Jr., Hickory, N.C., assignor to Broyhill Furniture Industries, Inc., Lenoir, N.C.
Continuation-in-part of Ser. No. 956,211, Oct. 30, 1978. This application May 14, 1981, Ser. No. 263,412
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—154

271,260
COMPUTER DESK
Jeffrey A. Turner, 2901 W. Laurel La., Phoenix, Ariz. 85029
Filed Mar. 23, 1981, Ser. No. 246,284
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—161

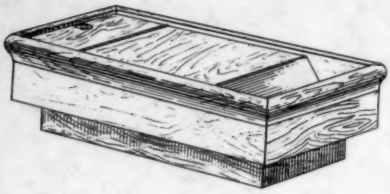


271,261
BOOKCASE OR SIMILAR ARTICLE
Nicholas A. Ungaro, Louisville, Ky., assignor to Schweiger Industries, Inc., Jefferson, Wis.
Division of Ser. No. 72,765, Sep. 5, 1979. This application Mar. 19, 1981, Ser. No. 245,679
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—167

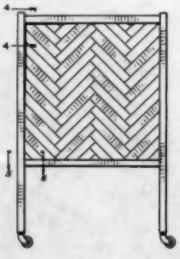


271,262
BOOKCASE OR SIMILAR ARTICLE
Nicholas A. Ungaro, Louisville, Ky., assignor to Schweiger Industries, Inc., Jefferson, Wis.
Division of Ser. No. 72,765, Sep. 5, 1979. This application Mar. 19, 1981, Ser. No. 245,677
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—168

271,263
TABLE OR SIMILAR ARTICLE
Nicholas A. Ungaro, Louisville, Ky., assignor to Schweiger Industries, Inc., Jefferson, Wis.
Division of Ser. No. 72,765, Sep. 5, 1979. This application Mar. 19, 1981, Ser. No. 245,676
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—179



271,264
CRIB FOOTBOARD
Merlin A. Brunner, New London; Harvey J. Draheim, Weyauwega, and Michael J. Schaffer, New London, all of Wis., assignors to Simmons Universal Corporation, New York, N.Y.
Filed Mar. 23, 1981, Ser. No. 246,354
The portion of the term of this patent subsequent to Jul. 19, 1997, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—198

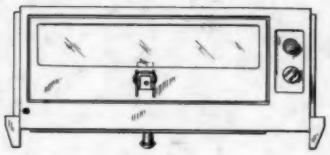


271,265
COMBINED PICTURE FRAME AND SUPPORT THEREFOR
George C. Sun, 530 Rhode Island Ave., Cherry Hill, N.J. 08002
Filed Oct. 26, 1981, Ser. No. 314,682
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—235

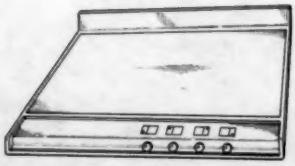
271,266
LOUNGE CHAIR COVER
Robert G. Thom, 40 Kiers Rd., Miami, Qld. 4220, Australia
Filed Feb. 25, 1981, Ser. No. 237,915
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D6—269

271,267
FORK OR SIMILAR ARTICLE
Oleg L. Cassini, New York, N.Y., assignor to American Home Products Corporation, New York, N.Y.
Filed Sep. 25, 1981, Ser. No. 305,598
Term of patent 14 years
Int. Cl. D07—*03*
U.S. Cl. D7—137

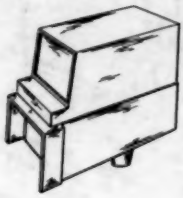
271,268
PIZZA OVEN
Ferdinand F. Salzmann, Prairie du Sac, and James P. Swinehart, Oregon, both of Wis., assignors to Wisco Industries, Inc., Oregon, Wis.
Filed Jun. 2, 1981, Ser. No. 269,638
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—350

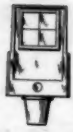


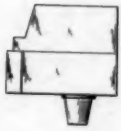
271,269
FLAT COOKING PANEL
Roland Vetter, Giengen, and Rolf Feil, Günzburg-Reisenburg, both of Fed. Rep. of Germany, assignors to Bosch-Siemens Hausgeräte GmbH, Stuttgart, Fed. Rep. of Germany
Filed Oct. 21, 1981, Ser. No. 313,618
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1981, MR 5288
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—363



271,270
BEVERAGE DISPENSING VALVE
Forrest L. Austin, Brooklyn Center, and William B. Mackrell, New Brighton, both of Minn., assignors to The Cornelius Company, Anoka, Minn.
Filed Aug. 31, 1981, Ser. No. 297,667
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D7—398







271,271

BEVERAGE DISPENSING VALVE

Forrest L. Austin, Brooklyn Center, and William B. Mackrell, New Brighton, both of Minn., assignors to The Cornelius Company, Anoka, Minn.

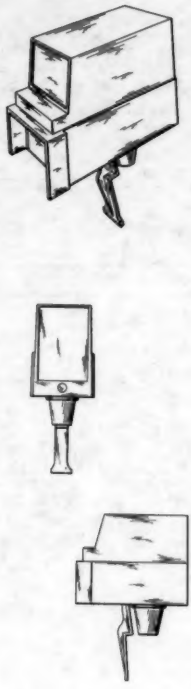
Filed Aug. 31, 1981, Ser. No. 297,668
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D7—398

271,272

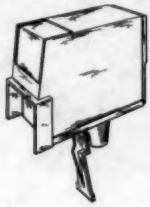
BEVERAGE DISPENSING VALVE

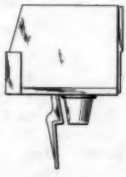
Forrest L. Austin, Brooklyn Center, and William B. Mackrell, New Brighton, both of Minn., assignors to The Cornelius Company, Anoka, Minn.

Filed Aug. 31, 1981, Ser. No. 297,669
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D7—398

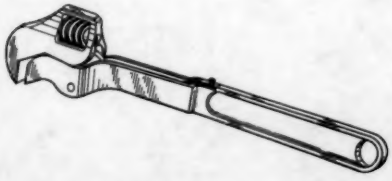


271,273
BEVERAGE DISPENSING VALVE
Forrest L. Austin, Brooklyn Center, and William B. Mackrell, New Brighton, both of Minn., assignors to The Cornelius Company, Anoka, Minn.
Filed Aug. 31, 1981, Ser. No. 297,670
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D7—398

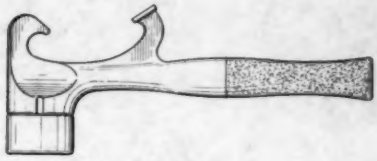




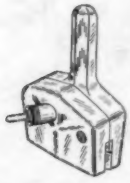
271,274
CONSECUTIVE-DRIVE TYPE ADJUSTABLE WRENCH
Noboru Tasato, 57 Aza Asato, Naha, Okinawa, Japan
Filed Apr. 2, 1981, Ser. No. 250,184
Claims priority, application Japan, Dec. 3, 1980, 55-50564
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—23



271,275
COMBINATION SPANNER WRENCH AND HAMMER
Vincent J. Richilano, Lakewood, Ohio, assignor to Zephyr Industries, Inc., Lakewood, Ohio
Filed Feb. 12, 1981, Ser. No. 233,631
Term of patent 14 years
Int. Cl. D8—*02*
U.S. Cl. D8—26



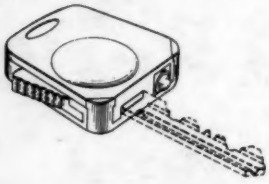
271,276
CHAIN SAW GUIDE BAR GRINDING DEVICE
Michael J. Reynolds, Gladstone, Oreg., assignor to Omark Industries, Inc., Oreg.
Filed Jan. 30, 1981, Ser. No. 229,780
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—91



271,277
DOOR CLOSER
Mitsuaki Okazaki, Fuchu, Japan, assignor to Ryobi Limited, Hiroshima, Japan
Filed Apr. 9, 1981, Ser. No. 252,281
Claims priority, application Japan, Oct. 17, 1980, 55-43480
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—330

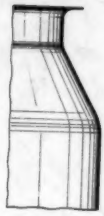
271,278
COMBINATION LOCK
Hisashi Saitoh, Kasugai, Japan, assignor to Saikosha Works Ltd., Kasugai, Japan
Filed Feb. 17, 1981, Ser. No. 235,384
Claims priority, application Japan, Oct. 24, 1980, 55-44749
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—339

271,279
ILLUMINABLE KEY HANDLE
Avi Cziment, 6732 de Vimy Ave., Montreal, Quebec, Canada H3S 2R9
Filed Feb. 5, 1981, Ser. No. 231,769
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—347

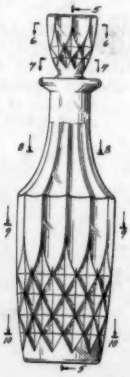


271,280
BOTTLE
Marianne Gaillot, Meudon, France, assignor to Lesieur-Cotelle Et Associes S. A., Boulougne-Sur-Seine, France
Filed Nov. 18, 1980, Ser. No. 207,948
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—349

271,281
CAN BODY
James B. Abbott, Great Shefford, and Ernest O. Kohn, Abingdon, both of England, assignors to Metal Box Limited, Reading, England
Filed Feb. 26, 1981, Ser. No. 238,427
Claims priority, application United Kingdom, Sep. 5, 1980, 80996455
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—351



271,282
BOTTLE OR THE LIKE
James L. Thrush, Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio
Division of Ser. No. 140,180, Apr. 14, 1980. This application May 14, 1982, Ser. No. 378,064
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—370

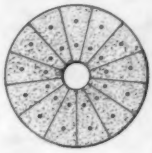


271,283
PACKAGING FORM FOR RAZORS
Anthony H. Taylor, London, England, assignor to Wilkinson Sword, Limited, England
Filed Jul. 6, 1981, Ser. No. 282,101
Claims priority, application United Kingdom, Jan. 6, 1981, 81998356
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—415

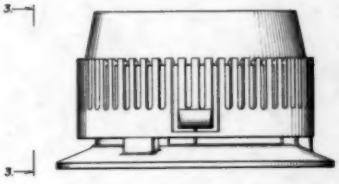
271,284
CONTAINER CLOSURE
Donald J. Bainton, Greenwich, Conn., assignor to The Continental Group, Inc., New York, N.Y.
Filed Jun. 8, 1981, Ser. No. 271,470
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—438

271,285
BOTTLE CAP
Ralph Lauren, New York, N.Y., assignor to Warner/Lauren Ltd., New York, N.Y.
Division of Ser. No. 923,413, Jul. 10, 1978, Pat. No. Des. 259,173. This application May 8, 1981, Ser. No. 261,439
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D9—454

271,286
PIERCED EAR-RING HOLDER
Howard Lauck, 17 Blossom Ct., Daly City, Calif. 94014
Filed Mar. 23, 1981, Ser. No. 246,899
Term of patent 14 years
Int. Cl. D09—*099*
U.S. Cl. D9—457

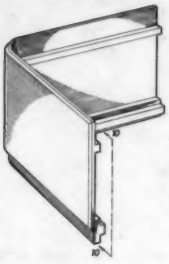


271,287
SMOKE DETECTOR
Kenneth R. Fenne, Glen Ellyn, Ill., assignor to Pittway Corporation, Aurora, Ill.
Filed Apr. 27, 1981, Ser. No. 257,529
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



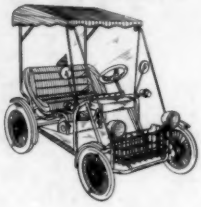
271,288
CLOCK FACE OR SIMILAR ARTICLE
Herman C. Bernick, 795 Vernon Ave., Glencoe, Ill. 60022
Filed Jul. 22, 1981, Ser. No. 285,851
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—126

271,289
PLANTING BOX CASING ELEMENT OR SIMILAR ARTICLE
Lars G. Carlsson, Nicandersgatan 1, 252 39 Helsingborg, Sweden
Filed Jun. 3, 1980, Ser. No. 155,973
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—164



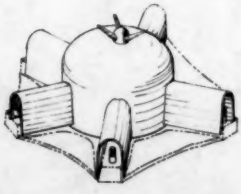
271,290
HEAVY DUTY MACHINE CARRIAGE
William J. Coughlin, Lancaster; David E. Johnson, Pataskala, and Kenneth E. McCall, Lancaster, all of Ohio, assignors to Arcair Company, Lancaster, Ohio
Filed Feb. 17, 1981, Ser. No. 235,339
Term of patent 14 years
Int. Cl. D12—*03*
U.S. Cl. D12—36

271,291
AUTOMOBILE
Terry C. Boone, 1343 N. Peach Ave., Fresno, Calif. 93727
Filed Dec. 8, 1980, Ser. No. 213,958
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—86

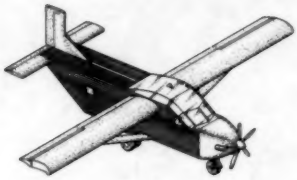


271,292
CONDENSATE COLLECTION AND REMOVAL DEVICE FOR PRESSURIZED AIR SUPPLY SUCH AS USED FOR OPERATING VEHICULAR AIR BRAKES
Michael E. Wilson; William L. Dixon, and Eric J. Bettencourt, all of Modesto, Calif., assignors to Racor Industries, Inc., Modesto, Calif.
Filed Jan. 15, 1981, Ser. No. 225,314
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—180

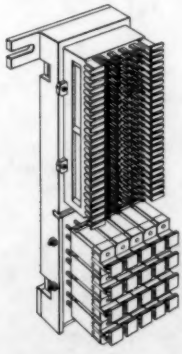
271,293
WHEEL COVER FOR TRUCKS
John G. Polka, 69 S. Lincoln Ave., Mundelein, Ill. 60060
Filed Dec. 22, 1980, Ser. No. 218,759
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—204



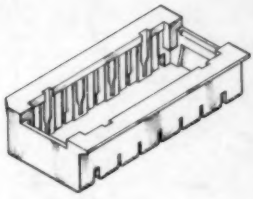
271,294
AIRPLANE
Ernest D. Hauk, Yucca Valley, Calif., assignor to Hawk Industries, Inc., Yucca Valley, Calif.
Filed Apr. 1, 1981, Ser. No. 250,072
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—344



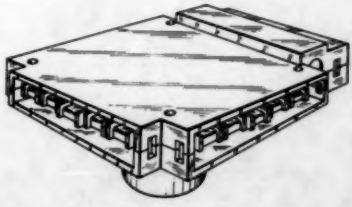
271,295
COMBINED TELEPHONE CONNECTOR BLOCK AND CIRCUIT PROTECTOR
Paul V. De Luca, Plandome Manor, and Thomas A. Hollfelder, Huntington, both of N.Y., assignors to Porta Systems, Corp., Syosset, N.Y.
Filed Aug. 4, 1980, Ser. No. 175,341
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24



271,296
COMBINED INTEGRATED CIRCUIT PACKAGE CARRIER AND SOCKET
James C. Jones, Georgetown, and James A. Emerson, Pekin, both of Ind., assignors to Robinson-Nugent, Inc., New Albany, Ind.
Filed Feb. 23, 1981, Ser. No. 236,669
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24

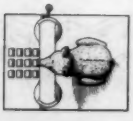


271,297
COMBINED CIRCUIT CONNECTOR AND SWITCHING MODULE
Nils G. Jonsson, Dunwoody, Ga., assignor to National Service Industries, Inc., Atlanta, Ga.
Filed Mar. 30, 1981, Ser. No. 248,967
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24



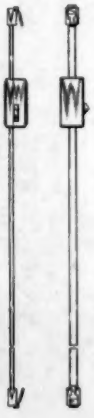
271,298
FLOPPYDISK
Kazumi Fujimoto, Hino, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Jun. 5, 1981, Ser. No. 270,839
Claims priority, application Japan, Dec. 9, 1980, 55-051362
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—11

271,299
DESK TELEPHONE
Ting H. Mak, 7816 Mulberry Bottom La., Springfield, Va. 22153
Filed Apr. 30, 1981, Ser. No. 259,117
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53



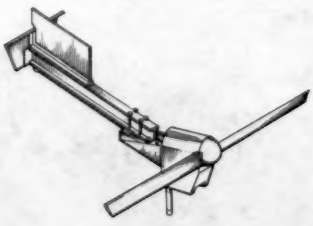
271,300
DESK TELEPHONE
Ting H. Mak, 7816 Mulberry Bottom La., Springfield, Va. 22153
Filed Apr. 30, 1981, Ser. No. 259,118
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53

271,301
TELEPHONE SWITCH-CONNECTOR UNIT
Frank B. Manning, Boston; Peter R. Kramer, Cambridge, both of Mass., and T. Pat Manning, St. Peters, Mo., assignors to Zoom Telephonics, Inc., Boston, Mass.
Filed Jan. 15, 1981, Ser. No. 225,447
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—59

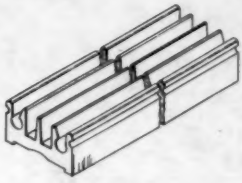


271,302
TELEPHONE SWITCH-CONNECTOR DEVICE
Frank B. Manning, Boston; Peter R. Kramer, Cambridge, both of Mass., and T. Pat Manning, St. Peters, Mo., assignors to Zoom Telephonics, Inc., Boston, Mass.
Filed Jan. 16, 1981, Ser. No. 225,858
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—59

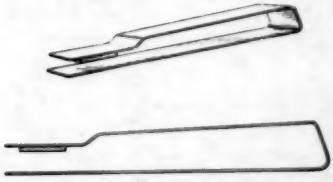
271,303
WIND TURBINE
Sherman Ovelmen, Elgin, Ill., assignor to Windgen, Limited, Elgin, Ill.
Filed May 11, 1981, Ser. No. 262,103
Term of patent 14 years
Int. Cl. D15—*01*
U.S. Cl. D15—1



271,304
WELDING SEAM BACK-UP EXTRUSION
Milo M. Kensrue, 601 Lido Park Dr., 8B, Newport Beach, Calif. 92663
Filed Jul. 14, 1980, Ser. No. 167,904
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—144



271,305
PHOTOGRAPHIC PRINT TONG OR SIMILAR ARTICLE
Edward Kostiner, 218 Oakridge Dr., Baie d'Urfe, Quebec, Canada (H9X 2N4)
Filed Nov. 20, 1981, Ser. No. 323,377
Term of patent 14 years
Int. Cl. D16—*04*
U.S. Cl. D16—36



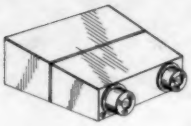
271,306
COMBINED ELECTRONIC FLASH UNIT AND ADAPTER MODULE
Steven W. Shull, Culver City, Calif., assignor to Vivitar Corportion, Santa Monica, Calif.
Filed Apr. 3, 1981, Ser. No. 250,901
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—42

271,307

PAIR OF BINOCULARS

John R. Green, 19645 Rosita St., Tarzana, Calif. 98221, and Charles D. Turner, 48 Eastfield Dr., Rolling Hills, Calif. 90274

Filed Mar. 27, 1981, Ser. No. 248,051
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—133



271,308

COMBINED HOLDER AND MAGNIFIER FOR GEM EXAMINATION

Susan Leo, New York, N.Y., assignor to Ridgecrest, Inc., New York, N.Y.

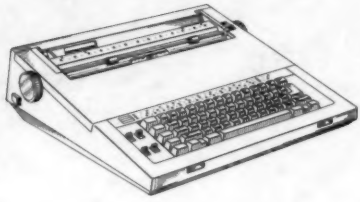
Filed Mar. 6, 1981, Ser. No. 241,452
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—135

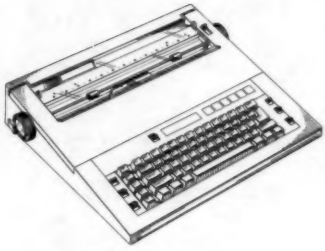
271,309

TYPEWRITER

Takuo Hirano, Tokyo, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed May 6, 1982, Ser. No. 375,402
Claims priority, application Japan, Dec. 1, 1981, 56-53275; Jan. 22, 1982, 57-2397
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—1



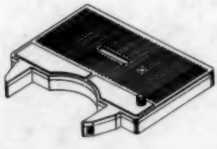


271,310

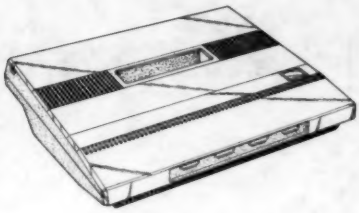
RIBBON CARTRIDGE OR THE LIKE

Daniel Canning, Dublin; Vito Viola, San Leandro, and James B. Jordan, Berkeley, all of Calif., assignors to Oume Corporation, San Jose, Calif.

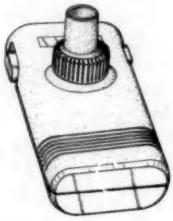
Filed Mar. 10, 1980, Ser. No. 129,271
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—12



271,311
VIDEO GAME CONSOLE
Regan L. Cheng, San Jose, Calif., assignor to Atari, Inc., Sunnyvale, Calif.
Filed Jan. 7, 1982, Ser. No. 337,882
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—13

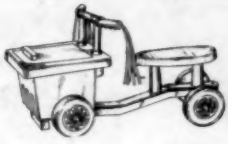


271,312
VIDEO GAME CONTROLLER
William J. Renteria, San Jose, Calif., assignor to Atari, Inc., Sunnyvale, Calif.
Filed Jan. 7, 1982, Ser. No. 337,883
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—48

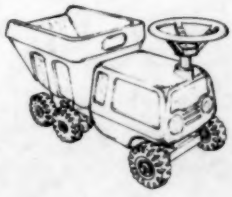


271,313
VIDEO GAME CONTROLLER
Roy M. Nishi, San Jose, Calif., assignor to Atari, Inc., Sunnyvale, Calif.
Filed Jan. 7, 1982, Ser. No. 337,887
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—48

271,314
RIDING TOY
Rimvydas A. Tveras, Oak Park, Ill., assignor to Milton Bradley International, Inc., Springfield, Mass.
Filed Mar. 19, 1981, Ser. No. 245,618
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—76

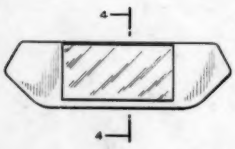


271,315
TOY DUMP TRUCK OR SIMILAR ARTICLE
John R. Nottingham, 4875 Stacy Ct., Richmond Heights, Ohio 44143, and John W. Spirk, Jr., 2533 Euclid Heights Blvd., Cleveland Heights, Ohio 44106
Continuation-in-part of Ser. No. 962,299, Nov. 20, 1978. This application Aug. 31, 1981, Ser. No. 297,563
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—78



271,316
DOLL
Betty H. Buckley, 662 Linden Ave., York, Pa. 17404
Filed Aug. 21, 1981, Ser. No. 294,897
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—171

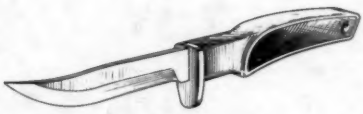
271,317
GOLF PUTTER HEAD
Robert J. Bretl, Menominee, Mich., assignor to R. A. Lockhart and Company, Grosse Point Woods, Mich.
Filed Nov. 18, 1981, Ser. No. 322,406
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—219



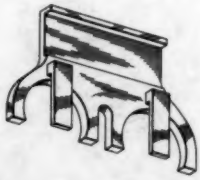
271,318
SURFBOARD FIN
Terrence L. Hope, 1326½ Engracia Ave., Torrance, Calif. 90501
Filed Jul. 13, 1981, Ser. No. 282,384
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—231

271,319
GOLF SWING TRAINING AID
Ernest J. Barty, Jr., 105 Virginia Dr., Painesville, Ohio 44077
Filed Sep. 17, 1981, Ser. No. 303,045
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—234

271,320
KNIFE
Robert Ferraro, Springfield, Mass., assignor to Bangor Punta Corporation
Filed Sep. 21, 1981, Ser. No. 303,972
Term of patent 14 years
Int. Cl. D22—*02*
U.S. Cl. D22—1



271,321
SHOTGUN LOADING DEVICE
Henry Ciciliot, Lorain Cir., R.D. 1, Box 270-A, and Robert Ciciliot, 1335 N. Ott St., both of Allentown, Pa. 18104
Filed Aug. 21, 1981, Ser. No. 295,217
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—7

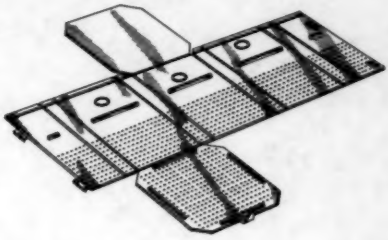


271,322
FISHING LURE
John J. Wasson, Alexandria, La., assignor to Smithwick Lures, Inc., Shreveport, La.
Filed Sep. 3, 1981, Ser. No. 299,112
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

271,323
LURE FOR TROUT
Bennie A. Leatherwood, Rte. 1, Box 282-B, Benton, Tenn. 37307
Filed Sep. 16, 1981, Ser. No. 302,727
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

271,324
FISHING LURE
David D. Moore, 4970 Birch Ave., Rockford, Ill. 61111
Division of Ser. No. 16,337, Feb. 28, 1979, Pat. No. Des. 261,921. This application Aug. 28, 1981, Ser. No. 297,516
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—28

271,325
FILTER HOUSING BLANK
Laurence R. Gedye, East Doncaster, Australia, assignor to L.R. & N.R. Gedye Pty. Ltd., Australia
Filed Feb. 9, 1981, Ser. No. 232,716
Claims priority, application Australia, Aug. 7, 1980, 81732
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4



271,326
WATER CLOSET
Donald W. Doman, Janesville, and Norman J. Jaeckels, Sheboygan, both of Wis., assignors to Kohler Co., Kohler, Wis.
Filed Oct. 22, 1981, Ser. No. 313,730
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—65

271,327

IGNITER FOR GAS DISCHARGE PIPES

Romeo E. Guerra, Dallas, and Robert H. Nelson, Plano, both of Tex., assignors to Nova Patents of North America, Inc., Dallas, Tex.

Filed May 26, 1981, Ser. No. 266,927

Term of patent 14 years

Int. Cl. D23—*03*

U.S. Cl. D23—90.1

271,328

EVAPORATIVE COOLER

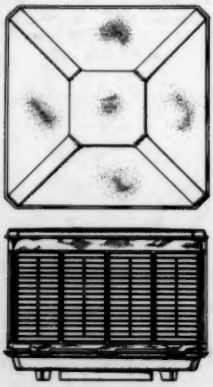
Ted B. Lanier, and Ras Redwine, V, both of Amarillo, Tex., assignors to RLI Inc., Amarillo, Tex.

Filed Jul. 21, 1980, Ser. No. 170,898

Term of patent 14 years

Int. Cl. D23—*04*

U.S. Cl. D23—139



271,329

FRESH AIR DUCT FOR A KITCHEN EXHAUST SYSTEM

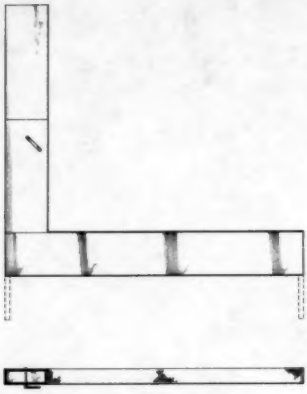
Clarke T. Welsh, Logansport, Ind., assignor to Logansport Distributors, Inc., Logansport, Ind.

Filed Aug. 1, 1980, Ser. No. 174,701

Term of patent 14 years

Int. Cl. D23—*04*

U.S. Cl. D23—163



271,330

CEILING FAN COVER PLATE

Yau Yung, Chaiwan, Hong Kong, assignor to Shell Electric Manufacturing Co., Ltd., Chaiwan, Hong Kong

Filed Nov. 13, 1981, Ser. No. 321,324

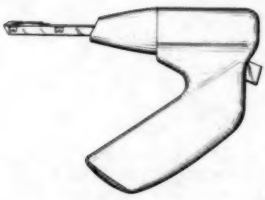
Claims priority, application United Kingdom, May 13, 1981, 1000456

Term of patent 14 years

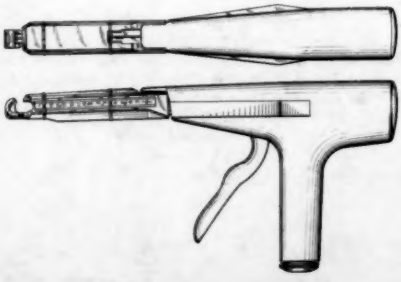
Int. Cl. D23—*04*

U.S. Cl. D23—163

271,331
POWERED SKIN STAPLER
David T. Green, Norwalk; Paul Rawson, Easton, and Richard Yagami, Bridgewater, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.
Filed Jun. 3, 1981, Ser. No. 270,277
Claims priority, application Australia, Dec. 19, 1980, 82,881; Dec. 19, 1980, 82,882; Canada, May 12, 1981, 12-05-81-5
Term of patent 14 years
Int. Cl. D24—*02*; D8—*05*
U.S. Cl. D24—26

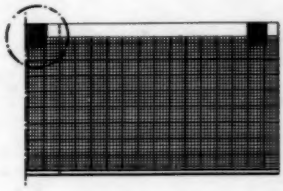


271,332
SURGICAL OCCLUDING AND CUTTING INSTRUMENT
David T. Green, Norwalk; Paul O. Rawson, Easton, and Richard Yagami, Bridgewater, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.
Filed Jun. 3, 1981, Ser. No. 270,280
Claims priority, application Australia, Dec. 19, 1980, 82,885; Dec. 19, 1980, 82,886; Canada, May 16, 1981, 12-05-81-6
Term of patent 14 years
Int. Cl. D24—*02*; D8—*05*
U.S. Cl. D24—26

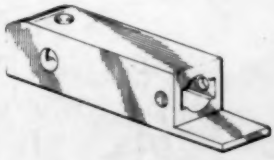


271,333
FIXED LENGTH BLOOD CONTAINER
William Trugio, Sayville, N.Y., assignor to Wright Laboratories, Inc., Bohemia, N.Y.
Filed Oct. 1, 1980, Ser. No. 192,768
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—56

271,334
ELECTROCARDIOGRAPHIC RECORDING PAPER
Hyman Grossman, Buchanan, N.Y., assignor to Cambridge Instruments, Inc., Ossining, N.Y.
Filed Mar. 2, 1981, Ser. No. 239,462
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—99



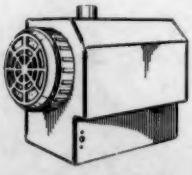
271,335
CUVETTE HOLDER
Sanford L. Simons, 9188 S. Turkey Creek Rd., Morrison, Colo. 80465
Filed Mar. 16, 1981, Ser. No. 243,756
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—99



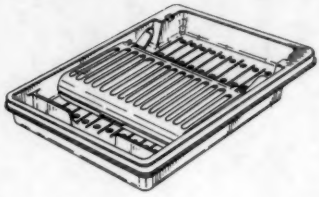
271,336
TASK LIGHT BRACKET
Robert J. Squitieri, 1900 Fullerton Rd., Rowland Heights, Calif. 91748, and David Bermani, 151 N. Corner Ave., Fullerton, Calif.
Filed Apr. 6, 1981, Ser. No. 251,513
Term of patent 14 years
Int. Cl. D8—*08;* D26—*05*
U.S. Cl. D26—138

271,337
COSMETIC CONTAINER
Thomas F. Holloway, Southbury, Conn., assignor to Risdon Corporation, Naugatuck, Conn.
Filed Dec. 31, 1981, Ser. No. 336,076
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—85

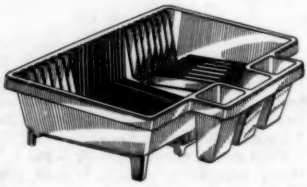
271,338
PORTABLE AIR FILTRATION UNIT
Hubert G. Dukowski, Suite 802, 555 W. 28th St., North Vancouver, British Columbia, Canada
Filed Mar. 16, 1981, Ser. No. 244,485
Claims priority, application Canada, Sep. 16, 1980, 16-09-80-2
Term of patent 14 years
Int. Cl. D29—*99;* D23—*04*
U.S. Cl. D29—6



271,339
COMBINED DISH RACK AND DRAINER
Keith K. K. Lee, Hong Kong, Hong Kong, assignor to Kee Cheong Lee's Co. Ltd., Hong Kong
Filed May 1, 1981, Ser. No. 259,391
Claims priority, application United Kingdom, Dec. 29, 1980, 998248
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D32—55



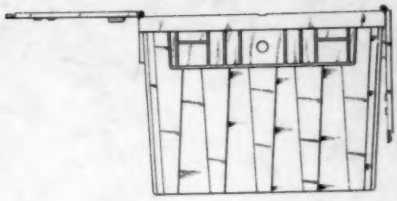
271,340
SIDE DRAINING DISH RACK
William D. Taylor, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Apr. 12, 1982, Ser. No. 367,579
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D32—55



271,341
COMBINED CONVEYOR CARRIER AND TRACK UNIT
Clarence A. Dehne, Farmington Hills, Mich., assignor to Jervis B. Webb Company, Farmington Hills, Mich.
Filed Apr. 17, 1981, Ser. No. 255,113
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D34—28

271,342
BARREL
Darrell L. Templeton, Golden, Colo., assignor to Adolph Coors Company, Golden, Colo.
Filed Mar. 6, 1981, Ser. No. 241,409
Term of patent 14 years
Int. Cl. D9—*02*
U.S. Cl. D34—39

271,343
BOX
Daniel R. Miller, Cincinnati, Ohio, assignor to Nestier Corporation, Cincinnati, Ohio
Filed Mar. 26, 1981, Ser. No. 247,911
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D34—43



REEXAMINATIONS

NOVEMBER 8, 1983

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,219,126 (131st)
SAFE CARTRIDGE FOR GAS

Katsuo Oana, 17-6, 4 chome, Sugano, Ichikawa-shi, Chiba-ken, Japan

Reexamination Request No. 90/000,190, Apr. 14, 1982.
Reexamination Certificate for Patent No. 4,219,126, issued Aug. 26, 1980, Ser. No. 25,061, Mar. 29, 1979.
Int. Cl.³ B65D *25/00*
U.S. Cl. 220—89 A

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1–3 are determined to be patentable as amended:

New claims 4–6 are added and determined to be patentable.

1. A cartridge assembly for containing gas, said cartridge being formed of a cylinder and a sealing plate, said plate serving to control the passage of gas out of said cylinder when excessive pressure is developed within said cartridge, including: a body, and said sealing plate positioned [at] *to* the top of said body, said plate being formed with a recess *creating a thinned portion* disposed along a central portion thereof, and being responsive to the formation of excessive pressure within *said* cylinder[,] to bow outwardly across its entire width, until the deformation of said plate under pressure is complete *with tension and sheer stresses acting on the bottom of said recess,* said recess under pressure being [rupturable within a limited area] *formed in shape like a mortar in which the thickness of said plate increases from its center portion to the circumference, so as to rupture within a limited area by the formation of hairline-like cracks and without the softening or melting of said thin portion of said plate,* to cause *the gradual* venting of the gas from within said [cylinder] *chamber* at a relatively slow and *safely* controlled rate of emission *and without any blow-out of said plate or explosion of said cartridge.*

B1 3,558,040 (132nd)
TWO-WAY ENVELOPE

Lloyd H. Krueger, Ontario, Canada, assignor to Century Envelope Co., Inc., Deer Park, N.Y.

Reexamination Request No. 90/000,210, Jun. 1, 1982.
Reexamination Certificate for Patent No. 3,558,040, issued Jan. 26, 1971, Ser. No. 827,768, May 26, 1969.
Claims priority, application Canada, May 25, 1968, 020950
Int. Cl.³ B65D *27/06*
U.S. Cl. 229—73

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim 1 is determined to be patentable as amended:

New claims 2–4 are added and determined to be patentable.

1. An envelope for two-way mailing, said envelope being formed from a one piece blank and comprising:

a. a front panel having side, top and bottom borders and having inner and outer surfaces,

b. a rear panel [also] having side, top and bottom borders and inner and outer surfaces,

c. the front and rear panels being joined together at their bottom borders about a first fold line and lying with their inner surfaces in opposed relation,

d. the front panel being of substantially the same width and of greater height than the rear panel,

e. a first closure flap joined to the front panel at the top border thereof [, said top border] *and* forming a second fold line *therewith,* the first closure flap having inner and outer surfaces, the inner surface having adhesive thereon *which, after activation and securing of said first closure flap to said rear panel, permits removal of said first closure flap without tearing of said rear panel,*

f. said front panel including a line of perforations spaced substantially parallel to and spaced below said second fold line to define a strip therebetween, said line of perforations extending only through the said front panel to facilitate the removal of said first closure flap from said envelope,

g. [f]. a second closure flap joined to the rear panel at the top border thereof [, said top border] *and* forming a third fold line *therewith,* the second closure flap having inner and outer surfaces, the inner surface having adhesive thereon, *and said second closure flap being folded about said third fold line prior to formation of said envelope so that it is fully disposed between said front panel and said rear panel when said envelope is formed,* and

h[g]. a pair of side flaps joined to the front panel at the side borders thereof and folded over the outer surface of the rear panel, the side flaps being sealed to the outer surface of the rear panel to maintain the inner surfaces of the front and rear panels in opposed relation, the side flaps being located on the said side borders so as to cover the edges of the said *folded* third fold line *to prevent the severing of said third fold line by the inadvertent insertion of a letter opener into said third fold line and the premature removal of said second closure flap therefrom, the top of said side flaps being substantially coextensive with said line of perforations,* whereby the envelope may be closed initially by activating the adhesive on the first closure flap and folding the first closure flap about the second fold line down over the outer surface of the rear panel and sealing it thereto, and when received, the envelope may be opened *and reused by removing the first closure flap by tearing along the said line of perforations without disturbing the remainder of the envelope, and then* [by cutting along the second fold line and then closed for reuse by] removing the second closure flap from its position between the front and rear panels and activating the adhesive on the second closure flap and folding it about the third fold line down over the outer surface of the front panel and sealing it thereto.

B1 4,146,489 (133rd)
POLYOLEFIN GRAFT COPOLYMERS AND LUBRICATING OILS AND FUELS CONTAINING SAME

Robert L. Stambaugh, Hatboro, and Richard A. Galluccio, Perkasie, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Reexamination Request No. 90/000,220, Jun. 23, 1982.
Reexamination Certificate for Patent No. 4,146,489, issued Mar. 27, 1979, Ser. No. 843,300, Oct. 18, 1977.
Continuation-in-part of Ser. No. 600,652, Jul. 31, 1975, abandoned.
Int. Cl.³ C10M *1/32, 3/26;* **C10L** *1/14, 1/22;* **C08F** *271/02*
U.S. Cl. 252—50

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1, 12, 17, 22–25, and 28 are determined to be patentable as amended:

Claims 2–11, 13–16, 18–21, 26, 27, and 29–34, dependent on amended claims, are determined to be patentable.

1. A lubricating oil containing a viscosity index improving and dispersant amount of a *chemically induced, free radical initiated* graft copolymer consisting essentially of an oil soluble, substantially linear, rubbery hydrocarbon backbone polymer selected from ethylene/propylene copolymer and ethylene/propylene diene modified terpolymer, said backbone polymer having graft polymerized thereon monomer units selected from C-vinylpyridines and N-vinylpyrrolidone.

12. A hydrocarbon fuel containing a dispersant amount of a *chemically induced, free radical initiated* graft copolymer consisting essentially of an oil soluble, substantially linear, rubbery hydrocarbon backbone polymer selected from ethylene/propylene copolymer and ethylene/propylene diene modified terpolymer, said backbone polymer having polymerized thereon graft monomer units selected from C-vinylpyridines and N-vinylpyrrolidone.

17. A process for preparing a *chemically induced, free radical initiated* graft copolymer, comprising intimately admixing (a) an oil soluble, substantially linear, rubbery hydrocarbon backbone polymer selected from ethylene/propylene copolymer and ethylene/propylene copolymer diene modified terpolymer, (b) graft monomer selected from C-vinylpyridines and N-vinylpyrrolidone, and (c) a free radical initiator capable of hydrogen abstraction, said admixing being effected at a temperature below the decomposition temperature of the initiator, and raising the temperature of the reaction mixture to or above said decomposition temperature.

28. A *chemically induced, free radical initiated* graft copolymer effective for imparting dispersant properties to hydrocarbon fuels and both dispersancy and viscosity index improvement to lubricating oils, said graft copolymer consisting essentially of an oil soluble, substantially linear, rubbery hydrocarbon backbone polymer selected from ethylene/propylene copolymer and ethylene/propylene diene modified terpolymer, said backbone polymer having graft polymerized thereon monomer units selected from C-vinylpyridines and N-vinylpyrrolidone.

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF NOVEMBER, 1983

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A.J.P. Scientific, Inc.: *See*—
DiMaggio, Joseph P., Jr.; Eng, Henry; Ball, Donald A.; and Walenciak, Kenneth J., 4,413,584., Cl. 118-56.000.

Abe, Shunichi; and Akiyama, Mitsuo, to Konishiroku Photo Industry Co., Ltd. Copying apparatus with scanning position control. 4,413,900., Cl. 355-8.000.

Abe, Yoshikazu: *See*—
Maruyama, Teruo; Yamauchi, Shinya; and Abe, Yoshikazu, 4,413,963., Cl. 418-259.000.

Aberg, Erik O. Scaled-down golf course game. 4,413,827., Cl. 273-176.0AB.

Abex Corporation: *See*—
Farr, Aaron V., 4,414,518., Cl. 335-205.000.

Abraham, Bernard M.; Miyano, Kenjiro; and Ketterson, John B. Horizontal film balance having wide range and high sensitivity. 4,413,506., Cl. 73-64.400.

Abrams, David E.; Curbelo, Raul; and Turner, R. Brough, to Bio-Rad Laboratories, Inc. Scanning interferometer control systems. 4,413,908., Cl. 356-346.000.

Accumulatoranfabrik Sonnenschein GmbH: *See*—
Jache, Otto; and Schroeder, Heinz, 4,414,302., Cl. 429-190.000.

Ackley, Michael. Material orientation apparatus and method. 4,413,556., Cl. 101-40.000.

Adams, Leon M.: *See*—
Tomlinson, Samuel J., Sr.; Dean, Edward E.; and Adams, Leon M., 4,414,227., Cl. 424-331.000.

Adler, Harold A. Dispenser for repelling animals. 4,413,757., Cl. 222-105.000.

Adolphi, Heinrich: *See*—
Loeffler, Hans-Peter; and Adolphi, Heinrich, 4,414,208., Cl. 424-224.000.

Advanced Micro Devices, Inc.: *See*—
Erb, Darrell M., 4,413,402., Cl. 29-571.000.
Wong, Thomas S. W., 4,414,502., Cl. 323-315.000.

Advanced Semiconductor Materials Die Bonding, Inc.: *See*—
Gessner, Gerald A., 4,414,498., Cl. 318-696.000.

AER Corporation: *See*—
Villalobos, Joseph A.; and Psyhojos, Triffin G., 4,413,427., Cl. 34-46.000.

AFGA-Gevaert AG: *See*—
Bauer, Walter, 4,413,896., Cl. 354-277.000.

Agfa-Gavaert Aktiengesellschaft: *See*—
Langen, Hans; Rosenhahn, Lothar; and Wolff, Erich, 4,414,309., Cl. 430-551.000.

Aggen, George; and Borneman, Paul R., to Allegheny Ludlum Steel Corporation. Iron-chromium-aluminum alloy and article and method therefor. 4,414,023., Cl. 75-124.000.

Ahuja, Sudhir R.; and Sharma, Dhiraj K., to Bell Telephone Laboratories, Incorporated. System for displaying overlapping pages of information. 4,414,628., Cl. 364-200.000.

Aiello, Robert P., to Shell Oil Company. Aqueous lubricating compositions. 4,414,121., Cl. 252-49.500.

Aisan Industry Co., Ltd.: *See*—
Ii, Akira; Sasano, Mitunori; Morishita, Michio; Kuno, Mikio; and Kadowaki, Kunio, 4,414,162., Cl. 261-23.00A.

Aisin Seiki Kabushiki Kaisha: *See*—
Nagashima, Takashi, 4,413,861., Cl. 303-6.00C.
Taguchi, Kazufumi, 4,413,576., Cl. 112-158.00B.

Akashi, Goro: *See*—
Kitamoto, Tatsuji; Shirahata, Ryuji; Yamada, Yasuyuki; and Akashi, Goro, 4,414,271., Cl. 428-328.000.
Miyoshi, Takahito; Okutu, Toshimitu; Akashi, Goro; Kitamoto, Tatsuji; and Fujiyama, Masaaki, 4,414,270., Cl. 428-325.000.

Akhtar-Khavari, Fuad; and Lobin, Bernard J., to Rockwell International Corporation. Pipe repair clamp. 4,413,388., Cl. 24-279.000.

Akita, Shuichi; Chida, Takeshi; Watanabe, Hiroyuki; and Ueda, Akio, to Nippon Zeon Co. Ltd. Rubber composition. 4,414,363., Cl. 525-237.000.

Akiyama, Mitsuo: *See*—
Abe, Shunichi; and Akiyama, Mitsuo, 4,413,900., Cl. 355-8.000.

Akiyama, Taichiro; and Wada, Fumio, to Koken Co., Ltd. Impermeable laminate membrane. 4,413,359., Cl. 3-1.000.

Aktiebolaget Platmanufaktur: *See*—
Larsson, Lars-Goran; and Murne, Bertil S. O., 4,413,464., Cl. 53-412.000.

Albany International Corp.: *See*—
Coplan, Myron J.; Park, Chunghi H.; and Williams, Samuel C., 4,414,368., Cl. 525-534.000.
Renjilian, Armen; Curry, Thomas H.; and Siracusano, Elizabeth, 4,413,391., Cl. 28-166.000.

Alcan International Limited: *See*—
Spence, John S., 4,414,070., Cl. 204-225.000.

Aldinger, Fritz: *See*—
Bruning, Rolf; Breidenbach, Poul-Erik; Cibis, Norbert; Aldinger, Fritz; and Werdecker, Waltraud, 4,414,014., Cl. 65-31.000.

Alfs, Helmut: *See*—
Keil, Hans S. H., deceased; Alfs, Helmut; and Schulze, Klaus, 4,414,125., Cl. 252-75.000.

Allard, Edward F. Thermal signature supression. 4,413,668., Cl. 165-1.000.

Allegheny Ludlum Steel Corporation: *See*—
Aggen, George; and Borneman, Paul R., 4,414,023., Cl. 75-124.000.

Allen, Clifford W., Jr., to Lexair, Inc. Capacity control arrangement for fixed speed compressor. 4,413,951., Cl. 417-53.000.

Allen & Hanburys Limited: *See*—
Cook, Peter B.; and Hunt, John H., 4,414,209., Cl. 424-243.000.

Allewitz, Murry, to Oil Air Industries, Inc. Gas-liquid accumulator. 4,413,652., Cl. 138-31.000.

Allied Corporation: *See*—
Anderson, Philip M., III; and Reich, Ronald K., 4,414,519., Cl. 335-208.000.
Constein, Ronald L., 4,414,301., Cl. 429-136.000.
Oxenrider, Bryce C., 4,414,277., Cl. 428-395.000.
Paquin, Patrick J., 4,413,469., Cl. 57-293.000.
Schneider, John T., 4,414,500., Cl. 318-799.000.
Wu, Tse C.; Prevorsek, Dusan C.; and Wertz, David H., 4,414,366., Cl. 525-439.000.

Allis-Chalmers Corporation: *See*—
Nolan, John J., 4,414,116., Cl. 210-695.000.

Allison Corporation: *See*—
Seltzer, Samuel M.; and Dennison, Saul, 4,414,611., Cl. 362-183.000.

Alpern, Marvin: *See*—
Cerwin, Robert J.; and Alpern, Marvin, 4,413,727., Cl. 206-63.300.

Alter, Seymour S., to New York Envelope Corp. Method and apparatus for making window envelopes. 4,413,984., Cl. 493-222.000.

Aluminum Company of America: *See*—
Becker, Aaron J., 4,414,188., Cl. 423-297.000.
McMonigle, Matthew J.; and LaCamera, Alfred F., 4,414,089., Cl. 204-244.000.
The, Paul J., 4,414,115., Cl. 210-665.000.

Amano, Masatoshi: *See*—
Miyazawa, Kokichi; Nakata, Kazuo; Ishikawa, Tsuneo; Honma, Ichiro; Koyama, Arata; and Amano, Masatoshi, 4,414,245., Cl. 427-127.000.

Ambros, Otto: *See*—
Hartmann, Ludwig; and Ambros, Otto, 4,414,262., Cl. 428-222.000.

Amchem Products, Inc.: *See*—
Hall, Wilbur S., 4,414,350., Cl. 524-320.000.

Amemiya, Shinichi: *See*—
Murakami, Keiichi; Amemiya, Shinichi; Miyazaki, Junji; Yanashima, Tadahiko; Iida, Atsuo; Shimura, Takaki; Miwa, Hirohide; and Midorikawa, Norio, 4,413,520., Cl. 73-609.000.

Amemiya, Yoshihito; Urisu, Tsuneo; and Mizushima, Yoshihiko, to Nippon Telegraph & Telephone Public Corporation. Bipolar transistors. 4,414,557., Cl. 357-16.000.

American Cyanamid Company: *See*—
Klempner, Daniel; and Frisch, Kurt C., 4,414,174., Cl. 264-328.600.
Nair, Vijay G.; and Bernstein, Seymour, 4,414,207., Cl. 424-180.000.

American Hoechst Corporation: *See*—
Martin, Lawrence L.; Ong, Helen H.; Anderson, Vernon B.; and Crichlow, Charles A., 4,414,219., Cl. 424-267.000.
Walls, John E.; and Dunder, Thomas A., 4,414,311., Cl. 430-157.000.

American Home Products Corporation: *See*—
Freed, Meier E., 4,414,389., Cl. 544-349.000.

American Science and Engineering, Inc.: *See*—
Annis, Martin; and Stein, Jay A., 4,414,682., Cl. 378-146.000.

American Screen Printing Equipment Company: *See*—
Bubley, Henry J., 4,413,559., Cl. 101-123.000.

American Sports Equipment: *See*—
Fernandez, David; and Fernandez, Helena J., 4,413,822., Cl. 273-73.00C.

Ametex AG: *See*—
Studinka, Josef; and Meier, Peter E., 4,414,031., Cl. 106-90.000.

AMM Incorporated: *See*—
Austin, Stephen D., 4,413,622., Cl. 128-205.250.

AMP Incorporated: *See*—
Rudy, William J., Jr.; and Zimmerman, John A., Jr., 4,413,872., Cl. 339-59.00M.
Swengel, Robert C., Jr., 4,413,871., Cl. 339-14.00R.

Ampex Corporation: *See*—
Griesshaber, Karl H.; and Bialo, Charles A., 4,414,573., Cl. 358-163.000.

Hathaway, Richard A., 4,414,588., Cl. 360-84.000.
Amstead, Billy H.: *See—*
Simpson, Robert E.; Amstead, Billy H.; and Barden, Charles R., 4,414,112., Cl. 210-512.100.
AMSTED Industries Incorporated: *See—*
Mulcahy, Harry W., 4,413,569., Cl. 105-168.000.
Amway Corporation: *See—*
Strobridge, John R., 4,414,199., Cl. 424-52.000.
Anderson, Edward A.; Bennett, Benjamin; and Gray, Billy D., to Hughes Aircraft Company. Defoaming electronic hardware. 4,414,606., Cl. 361-397.000.
Anderson, Frank E.; and Martin, Robert A. Sanitizer system and sanitizing method for carbonated beverage container filler machine. 4,414,036., Cl. 134-23.000.
Anderson, Glenys. Shut-off valve assembly. 4,413,806., Cl. 251-340.000.
Anderson, Harvey R.: *See—*
Pitts, Elvin C.; Burns, Walter G.; and Anderson, Harvey R., 4,413,618., Cl. 126-450.000.
Anderson, Paul S.; Christy, Marcia E.; Evans, Ben E.; and Remy, David C., to Merck & Co. Inc. Dibenzo[a,d]cycloocten-5,12-imines. 4,414,154., Cl. 260-245.700.
Anderson, Philip M., III; and Reich, Ronald K., to Allied Corporation. Temperature-sensitive relay. 4,414,519., Cl. 335-208.000.
Anderson, Robert A. Cartridge magazine. 4,413,437., Cl. 42-50.000.
Anderson, Vernon B.: *See—*
Martin, Lawrence L.; Ong, Helen H.; Anderson, Vernon B.; and Crichlow, Charles A., 4,414,219., Cl. 424-267.000.
Anderson, Weston A.; Clark, Lloyd D.; and Beaver, William L., to Diasonics Cardio/Imaging, Inc. Sector scanner display and recording system for ultrasonic diagnosis. 4,413,630., Cl. 128-661.000.
Anderson, Wilbur F.; and Griffith, Jon K., to Cummins Engine Company, Inc. Measuring apparatus. 4,413,418., Cl. 33-174.00L.
Andersson, Sten. Lifting means for goods. 4,413,853., Cl. 294-64.00R.
Andrejasich, Raymond J.: *See—*
Perry, Ralph A.; and Andrejasich, Raymond J., 4,414,441., Cl. 200-61.040.
Andrews, Christopher M., to Ciba-Geigy Corporation. Epoxide resin compositions containing esters as diluents and cure accelerators. 4,414,377., Cl. 528-88.000.
Angel, Norman. Support apparatus for motor vehicle bumper rack members. 4,413,761., Cl. 224-42.45R.
Angiomedics Corporation: *See—*
Schjeldahl, Gilmore T.; and Sharma, B., 4,413,989., Cl. 604-96.000.
Anne, Raymond E., to Eastman Kodak Company. Photoelectrophoretic duplex imaging apparatus and method. 4,413,898., Cl. 355-3.00P.
Annis, Martin; and Stein, Jay A., to American Science and Engineering, Inc. Penetrating radiant energy imaging system with multiple resolution. 4,414,682., Cl. 378-146.000.
Ansell, Raymond O., to Chloride Silent Power Limited. Electrochemical cells with beta alumina ceramic electrolyte material. 4,414,299., Cl. 429-104.000.
Antivols Simplex: *See—*
Thirion, Andre, 4,413,491., Cl. 70-252.000.
Aoki, Hatsuo: *See—*
Ikushima, Koichi; Tanaka, Hirokazu; Osamu, Ohe; Kino, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; Arakawa, Akira; and Imanaka, Hiroshi, 4,414,226., Cl. 424-279.000.
Aoyagi, Keizo: *See—*
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Aoyama, Naofumi: *See—*
Sakurada, Hiroshi; and Aoyama, Naofumi, 4,414,545., Cl. 340-790.000.
Applegate, Steven L.; and Molloy, James J., to International Business Machines Corporation. Ribbon loading system for printers. 4,413,919., Cl. 400-208.000.
Arai, Haruyoshi: *See—*
Shionoya, Hiroshi; Arai, Haruyoshi; Koyanagi, Nozomu; and Takeuchi, Hitoshi, 4,414,201., Cl. 424-88.000.
Arai, Hiroshi: *See—*
Sasaki, Hiroaki; Inoue, Testuya; Mineo, Yoshiharu; Iguchi, Sei; Makita, Kazuhide; Arai, Hiroshi; Itoh, Hajime; Ohta, Hisatoshi; Inazu, Masahiro; and Kawahashi, Akira, 4,413,424., Cl. 33-361.000.
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Arakawa, Akira: *See—*
Ikushima, Koichi; Tanaka, Hirokazu; Osamu, Ohe; Kino, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; Arakawa, Akira; and Imanaka, Hiroshi, 4,414,226., Cl. 424-279.000.
Archer, Emmit W.; and Gentle, Derek F., to Ford Motor Company. Method of manufacture of reinforced sheet plastics material and the production of moulded articles therefrom. 4,414,266., Cl. 428-287.000.
Archive Corporation: *See—*
Miller, William R.; and Howell, Jones V., 4,414,593., Cl. 360-102.000.
Ariizumi, Shoji, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of producing semiconductor devices. 4,413,403., Cl. 29-571.000.
Arizpe, Ramiro. Disposable bag mounting and shutdown mechanism for rotary lawn mower. 4,413,467., Cl. 56-11.300.
Armer, James P., to Boeing Company, The. Built-in passive fault detection circuitry for an aircraft's electrical/electronic systems. 4,414,539., Cl. 340-500.000.
Armour and Company: *See—*
Sleeth, Rhule B.; Theiler, Richard F.; and Rendek, Robert B., 4,414,232., Cl. 426-266.000.
Armour Pharmaceutical Company: *See—*
Orlowski, Ronald C.; and Seyler, Jay K., 4,414,149., Cl. 260-112.50T.
Armstrong, Gary D. Air separation for an oil pump. 4,414,006., Cl. 55-190.000.
Armstrong World Industries, Inc.: *See—*
Culp, Charles R.; Emmons, Larrimore B.; and Lewicki, Walter J., Jr., 4,414,317., Cl. 430-4.000.
Arnold, Peter: *See—*
Dausinger, Friedrich; Muller, Werner; and Arnold, Peter, 4,414,038., Cl. 148-4.000.
Arquie, Louis; and Thirouard, Michel, to Thomson-CSF. Moving system for a videodisk reader-recorder. 4,414,657., Cl. 369-45.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Iwaisako, Toshiyuki; and Inoue, Akio, 4,414,111., Cl. 210-500.200.
Kimoto, Kyoji; and Miyauchi, Hirotsugu, 4,414,338., Cl. 521-27.000.
Yamataka, Kazunori; Isoya, Toshiro; and Kitaguchi, Nobuya, 4,414,079., Cl. 204-75.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Tomori, Yasumasa, 4,413,893., Cl. 354-195.000.
Ash, Mary L.; Diephouse, Timothy R.; and Strom, Robert M., to Dow Chemical Company, The. Purification of 4,4-dihydroxybiphenyl. 4,414,422., Cl. 568-724.000.
Ash, Stephen R.: *See—*
Handt, Alan E.; and Ash, Stephen R., 4,413,988., Cl. 604-29.000.
Ashland Oil, Inc.: *See—*
Zandona, Oliver J.; and Hettinger, William P., Jr., 4,414,098., Cl. 208-120.000.
Atasi Corporation: *See—*
Farmer, Paul L.; Gibeau, Frank C.; Brown, Stanley F.; and Plonczak, Garold W., 4,414,594., Cl. 360-106.000.
Atelier de Construction Steiger S.A.: *See—*
Steiger, Gerard, 4,413,482., Cl. 66-78.000.
Atkins, Michael W.: *See—*
Avery, Randall N.; Clayton, Charles A.; Floyd, Levon R.; Mackintosh, Douglas B.; Powell, Willie A.; and Atkins, Michael W., 4,413,674., Cl. 165-104.330.
Atkinson, Anthony: *See—*
Hammond, Peter M.; Price, Christopher P.; Scawen, Michael D.; and Atkinson, Anthony, 4,414,327., Cl. 435-18.000.
Atlanta Felt Company, Inc.: *See—*
Miller, Joseph S.; and Aylor, Ronald L., 4,414,263., Cl. 428-234.000.
Atlantic Coast Carton Company: *See—*
Newcombe, Elliott H., Jr., 4,413,734., Cl. 206-455.000.
Atlantic Richfield Company: *See—*
Gaul, James M.; and Nguyen, Tinh, 4,414,361., Cl. 524-702.000.
Perkins, Thomas K., 4,413,679., Cl. 166-248.000.
Atlas Copco Aktiebolag: *See—*
Eklof, Ake T., 4,413,687., Cl. 173-134.000.
Au, Andrew T., to Dow Chemical Company, The. Cyano-(substituted and unsubstituted pyridinyl) methyl and aryl esters of carbonic acid. 4,414,218., Cl. 424-263.00U.
Aubouy, Michel; Hamel, Pierre; and Molin, Marc, to Rhone-Poulenc Agrochimie. Process for the manufacture of 2,6-dichloro-4-nitroaniline, and the compound obtained by this process. 4,414,415., Cl. 564-412.000.
Aurthur, William B., to Purex Corporation. Multi-ported valve with sealing network between valve body and rotor. 4,414,109., Cl. 210-278.000.
Austalian Atomic Energy Commission: *See—*
Watt, John S., 4,414,472., Cl. 250-359.100.
Austin, Stephen D., to AMM Incorporated. Oxygen manifold system. 4,413,622., Cl. 128-205.250.
Australian Paper Manufacturers Limited: *See—*
Trufitt, Alton D.; and Bringman, David J., 4,414,061., Cl. 162-295.000.
Automation International Corp.: *See—*
Peters, Alan R., 4,413,973., Cl. 425-461.000.
Automotive Products Limited: *See—*
Windsor, Harry M , 4,413,714., Cl. 192-0.033.
Avery, Randall N.; Clayton, Charles A.; Floyd, Levon R.; Mackintosh, Douglas B.; Powell, Willie A.; and Atkins, Michael W., to Westinghouse Electric Corp. Transformer cooling structure. 4,413,674., Cl. 165-104.330.
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Awa, Masashi: *See—*
Endo, Hiroshi; Awa, Masashi; Iiri, Shigeo; Oguchi, Toshihiko; Suzuki, Isao; Hirate, Naoyuki; and Hayashi, Masaru, 4,414,124., Cl. 252-62.630.
Axenko, Alexandr A.; Nazarian, Miron M.; Kolyada, Vladimir A.; Mataev, Arkady R.; and Shamsha, Ljudmila F. Apparatus for electrochemical purification of contaminated liquids. 4,414,091., Cl. 204-277.000.
Ayer, James R.: *See—*
Taylor, Verner L.; Sprowls, Joseph B., III; and Ayer, James R., 4,414,546., Cl. 340-825.300.
Aylor, Ronald L.: *See—*
Miller, Joseph S.; and Aylor, Ronald L., 4,414,263., Cl. 428-234.000.

Azegami, Hitoshi: *See*—
Kawahara, Hiroshi; Azegami, Hitoshi; and Horigome, Eiji, 4,414,288., Cl. 428-694.000.
Azumi, Toshinori: *See*—
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B. F. Goodrich Company, The: *See*—
Lane, Parley C., Jr., 4,414,386., Cl. 528-496.000.
Babiol, Pierre, to Societe Nouvelle de Bouchons Plastiques S.N.B.P. Expanded plastic bottle stopper. 4,413,744., Cl. 215-355.000.
Bailey, Alan C.; and Morrow, Alan J., to Corning Glass Works. Low viscosity core glass optical fiber. 4,413,882., Cl. 350-96.300.
Bakal, Abraham I.; and Buhler, Allen C., to Cumberland Packing Corp. Margarine and the like spread with natural butter flavor. 4,414,229., Cl. 426-98.000.
Baker Cac, Inc.: *See*—
Goans, Kip B., 4,413,651., Cl. 137-625.250.
Baker, Kenneth S.: *See*—
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Baker Oil Tools, Inc.: *See*—
Callihan, Rudy B.; and Wainwright, Clyde, 4,413,682., Cl. 166-382.000.
Baker, Rees T. K.: *See*—
Sherwood, Rexford D.; Baker, Rees T. K.; Derouane, Eric G.; and Pieters, Wim J. M., 4,414,256., Cl. 428-163.000.
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Baldwin, A. Frank, to Burlington Industries, Inc. Absorbent microbiocidal fabric and process for making same. 4,414,268., Cl. 428-289.000.
Ball, David N.: *See*—
Farquhar, Robert L.; and Ball, David N., 4,414,542., Cl. 340-578.000.
Ball, Donald A.: *See*—
DiMaggio, Joseph P., Jr.; Eng, Henry; Ball, Donald A.; and Walenciak, Kenneth J., 4,413,584., Cl. 118-56.000.
Ballard, Donald E.: *See*—
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Ballmann, Hans J.: *See*—
von der Eltz, Hans-Ulrich; Heinisch, Peter; and Ballmann, Hans J., 4,414,000., Cl. 8-555.000.
Balz, Gunther W., to Roto-Finish Company, Inc. Self-separating finishing machine having variable degrees of rotation and vibration, and method. 4,413,448., Cl. 51-313.000.
Bamberger, Carlos E. Preparation of metal phosphates by a reaction using boron phosphate. 4,414,187., Cl. 423-251.000.
Bannister, Ronald L.; and Beatty, John M., to Westinghouse Electric Corp. Turbine blade vibration detection apparatus. 4,413,519., Cl. 73-660.000.
Bantjes, John H.: *See*—
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Baraff, David R.; Serinken, Nur M.; Streater, Richard W.; Miner, Carla J.; Boynton, Robert J.; MacLaurin, Blair K.; and Westwood, William D., to Northern Telecom Limited. Displays controlled by MIM switches of small capacitance. 4,413,883., Cl. 350-334.000.
Barber-Colman Company: *See*—
Boyer, George C., 4,413,776., Cl. 236-49.000.
Barden, Charles R.: *See*—
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Barker, Kenneth M.: *See*—
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Barnes, S. Thomas: *See*—
Berlik, Lee J.; Barnes, S. Thomas; and Levi, David E., 4,413,611., Cl. 126-39.00E.
Barr, Rodney E.; and Donovan, Daniel L., to Borg-Warner Corporation. Fuel feed and charge forming apparatus. 4,414,163., Cl. 261-69.00A.
Barre, Francoise: *See*—
Eranian, Armand; Dubois, Jean-Claude; Gazard, Maryse; and Barre, Francoise, 4,414,081., Cl. 204-159.180.
Bartley, Burton H.: *See*—
Petty, Randall H.; and Bartley, Burton H., 4,414,138., Cl. 502-73.000.
Barton, George G., Jr.: *See*—
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Basalay, Robert J.: *See*—
West, C. Thomas; and Basalay, Robert J., 4,414,122., Cl. 252-49.700.
Baschang, Gerhard: *See*—
Tarcsay, Lajos; Baschang, Gerhard; Hartmann, Albert; and Stanek, Jaroslav, 4,414,204., Cl. 424-177.000.
Base, Leonard C. Wood toter. 4,413,834., Cl. 280-47.260.
BASF Aktiengesellschaft: *See*—
Kneller, Eckhart; Koenig, Roland; Koester, Eberhard; Grau, Werner; and Mayer, Dieter, 4,414,287., Cl. 428-650.000.
Loeffler, Hans-Peter; and Adolphi, Heinrich, 4,414,208., Cl. 424-224.000.
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BASF Wyandotte Corporation: *See*—
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Wilson, Joe C., 4,414,126., Cl. 252-78.300.
Basiulis, Algerd, to Hughes Aircraft Company. Switchable on-off heat pipe. 4,413,671., Cl. 165-1.000.
Batchelor, Douglas R.: *See*—
Batchelor, William H.; and Batchelor, Douglas R., 4,413,607., Cl. 123-590.000.
Batchelor, William H.; and Batchelor, Douglas R. Propane carburetion system. 4,413,607., Cl. 123-590.000.
Bates, Ronald F.: *See*—
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Battiston, Giancarlo: *See*—
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Baum, Kurt: *See*—
Berkowitz, Phillip T.; Baum, Kurt; and Grakauskas, Vytautas, 4,414,384., Cl. 528-417.000.
Baumgartner, Alfons, to Dr. Johannes Heidenhain GmbH. Electronic up-down conting system with directional discriminator. 4,414,678., Cl. 377-28.000.
Baur, Max, to Licinvest AG. Picture viewer. 4,413,435., Cl. 40-155.000.
Baxter Travenol Laboratories, Inc.: *See*—
Curchack, Leon T., 4,413,741., Cl. 215-100.00R.
Mittleman, Herbert, 4,413,990., Cl. 604-122.000.
Soika, Emil H., 4,413,992., Cl. 604-263.000.
Bayer AG: *See*—
Brooker, Peter J.; and Goose, John, 4,414,222., Cl. 424-270.000.
Bayer Aktiengesellschaft: *See*—
Ellendt, Gunther; Gleitsmann, Gunter; and Scheidel, Max, 4,414,074., Cl. 203-21.000.
Redmer, Frank; and Krippl, Kurt, 4,413,912., Cl. 366-69.000.
Bayer, Dean M.: *See*—
McMahan, David R.; Zeller, Gary P.; Slaughter, Ronald W.; Skirha, Martin D.; and Bayer, Dean M., 4,413,856., Cl. 296-188.000.
BBC Brown, Boveri & Company, Limited: *See*—
Moll, Rudolf; Ragaller, Klaus; and Schade, Ekkehard, 4,414,450., Cl. 200-147.00R.
Beach, Raymond D. Dental chair. 4,413,858., Cl. 297-188.000.
Beatty, John M.: *See*—
Bannister, Ronald L.; and Beatty, John M., 4,413,519., Cl. 73-660.000.
Beaver, William L.: *See*—
Anderson, Weston A.; Clark, Lloyd D.; and Beaver, William L., 4,413,630., Cl. 128-661.000.
Becker, Aaron J., to Aluminum Company of America. Production of zirconium diboride powder in a molten salt bath. 4,414,188., Cl. 423-297.000.
Becker, Horace W., to Xerox Corporation. Method and apparatus for replenishing marking material to a donor ribbon in a thermal marking printer system. 4,414,555., Cl. 346-76.0PH.
Becker, Werner; and Kistner, Heinz, to Esselte Pendaflex Corporation. Portable labeling machine. 4,414,054., Cl. 156-384.000.
Beckers, Hubertus F. M., to U.S. Philips Corporation. Method and apparatus for encoding digital data so as to reduce the D.C. and low frequency content of the signal. 4,414,659., Cl. 369-59.000.
Bedard, James F.; Eichelberger, Charles W.; and Nati, Salvatore F., Jr., to General Electric Company. Programmable signal amplitude control circuits. 4,414,501., Cl. 323-280.000.
Beeghly, Bruce R., to Economy Engine Company, The. Electronic ignition with advance. 4,413,608., Cl. 123-599.000.
Bel Fuse, Inc.: *See*—
Bernstein, Elliot, 4,414,528., Cl. 337-187.000.
Belamaric, Zelimir: *See*—
Schneider, Franz; Panknin, Walter; Belamaric, Zelimir; and Schalch, Fred, 4,414,455., Cl. 219-64.000.
Belkin, Michael; and Lund, David J. Instrument for object detection of ocular diseases. 4,413,890., Cl. 351-221.000.
Bell Telephone Laboratories, Incorporated: *See*—
Ahuja, Sudhir R.; and Sharma, Dhiraj K., 4,414,628., Cl. 364-200.000.
Forrest, Stephen R.; Kohl, Paul A.; and Panock, Richard L., 4,414,066., Cl. 204-129.300.
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Grube, Gerald W., 4,414,642., Cl. 364-766.000.
Johnsen, Ottar; and Netravali, Arun N., 4,414,580., Cl. 358-260.000.
Keramidas, Vassilis G.; McCoy, Robert J.; and Temkin, Henryk, 4,414,561., Cl. 357-67.000.
Belletire, John L., to Pfizer Inc. Organic diamine therapeutic compositions. 4,414,220., Cl. 424-267.000.
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Bellus, Daniel: *See—*
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Beloit Corporation: *See—*
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Bendix Corporation, The: *See—*
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Benerito, Ruth R.: *See—*
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Bennett, Benjamin: *See—*
Anderson, Edward A.; Bennett, Benjamin; and Gray, Billy D., 4,414,606., Cl. 361-397.000.

Bennett, James F., to GTE Products Corporation. Forward error correcting apparatus. 4,414,667., Cl. 371-37.000.

Bennett, Moreland P.; and Ballard, Donald E., to General Electric Company. Processing amorphous metal into packets by bonding with low melting point material. 4,413,406., Cl. 29-609.000.

Bentley Engineering Company Limited: *See—*
Smith, William C.; and Seekings, Gerald A. G., 4,413,483., Cl. 66-125.00R.

Berfield, Robert C., to Shop-Vac Corporation. Shoe attachment for wet/dry electric vacuum cleaner. 4,413,372., Cl. 15-414.000.

Berg, John L. Wave pump apparatus. 4,413,956., Cl. 417-333.000.

Berginski, Werner-Ernst; and Wessling, Wilhelm, to Leopold Kostal GmbH & Co. KG. Steering column switch. 4,414,442., Cl. 200-61.270.

Bergmann, Udo; Kurz, Heinrich; and Radtke, Wolfgang, to U.S. Philips Corporation. Printing head for ink jet printers. 4,414,552., Cl. 346-1.100.

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Romey, Ingo; and El-Roy, Menachem, 4,414,344., Cl. 524-65.000.

Berke, Herbert; and Portoghese, Joseph, to United States of America, Navy. Pattern generating circuit. 4,414,567., Cl. 358-139.000.

Berkowitz, Phillip T.; Baum, Kurt; and Grakauskas, Vytautas, to United States of America, Navy. Synthesis and polymerization of 3-azidooxetane. 4,414,384., Cl. 528-417.000.

Berlik, Lee J., to Raytheon Company. Ventilated gas range with modular cooking units. 4,413,610., Cl. 126-39.00K.

Berlik, Lee J.; Barnes, S. Thomas; and Levi, David E., to Raytheon Company. Modular gas range compartment. 4,413,611., Cl. 126-39.00E.

Bernath, Oskar, to Georg Fischer Brugg-Oehler AG. Method and apparatus for joining veneer strips. 4,414,050., Cl. 156-166.000.

Bernelin, Daniel; and Meyer, Jacques, to Chloe Chimie. Binder compositions for powder coatings. 4,414,279., Cl. 428-413.000.

Bernstein, Elliot, to Bel Fuse, Inc. Crimp fuse. 4,414,528., Cl. 337-187.000.

Bernstein, Seymour: *See—*
Nair, Vijay G.; and Bernstein, Seymour, 4,414,207., Cl. 424-180.000.

Berthold, John W., III; and Szczepanek, Paul S., to United States of America, National Security Agency. Method and apparatus for side launch excitation of selected modes in graded-index optical fibers. 4,413,879., Cl. 350-96.190.

Besson, Rene, to ETA S.A. Fabriques d'Ebauches ETA 13. Watch having an analog display and a digital display. 4,413,915., Cl. 368-71.000.

Betts, Edmund D., to Gregor Jonsson Associates, Inc. Shrimp stripper. 4,413,377., Cl. 17-73.000.

Beuchat, Roger, to Mefina S.A. Electronic fuse for projectiles. 4,413,563., Cl. 102-214.000.

Beugelsdyk, Anthony F.; Stuchlik, Terence J.; and Kester, Bruce J., to Conchemco, Incorporated. Control assembly for blade clutch unit. 4,413,466., Cl. 56-11.300.

Beutel, Phillip R.: *See—*
Jasso, Martin R., 4,413,636., Cl. 128-786.000.

Bex, Guy, deceased; by Bex, Josette, legal representative; and Carsoule, Yve. Epichlorohydrin-based flexible elastomer composition. 4,414,343., Cl. 523-440.000.

Bex, Josette, legal representative: *See—*
Bex, Guy, deceased; Bex, Josette, legal representative; and Carsoule, Yve, 4,414,343., Cl. 523-440.000.

BFG Glassgroup: *See—*
Van Laethem, Robert; and Terneu, Robert, 4,414,015., Cl. 65-60.300.

Bialo, Charles A.: *See—*
Griesshaber, Karl H.; and Bialo, Charles A., 4,414,573., Cl. 358-163.000.

Biava, Dominique: *See—*
Cornu, Jean; Detriche, Jean-Marie; Tiret, Bernard; Jorge, Gerard; Galera, Richard; Biava, Dominique; and Marchal, Paul, 4,413,910., Cl. 356-377.000.

Bich, Rene, to Societe J. G. Allinquant. Plug device for the penetration of a plunger rod into a cylinder of gas spring of the like. 4,413,817., Cl. 267-64.110.

Biederer, Hans H.: *See—*
Niwiera, Wolfgang; Holtorf, Franz-Josef; and Biederer, Hans H., 4,413,768., Cl. 228-173.00A.

Bielen, Denise M.: *See—*
Bielen, Theodore J., Jr.; and Bielen, Denise M., 4,413,589., Cl. 119-109.000.

Bielen, Theodore J., Jr.; and Bielen, Denise M. Collapsible animal leash. 4,413,589., Cl. 119-109.000.

Bieringer, Hermann: *See—*
Heier, Karl H.; Nestler, Hans J.; Bieringer, Hermann; and Bauer, Klaus, 4,414,020., Cl. 71-108.000.

Bierwith, Robert S. Wedge and clamp locking system. 4,413,432., Cl. 37-142.00A.

Bigelow-Sanford, Inc.: *See—*
Wind, Joseph H., 4,413,737., Cl. 206-599.000.

Biggar, Elizabeth Short: *See—*
Biggar, Frank M., III, 4,413,541., Cl. 83-346.000.

Biggar, Frank M., III, to Biggar, Elizabeth Short. Rapid changeover printer. 4,413,541., Cl. 83-346.000.

Bilbrey, Joseph T., Sr.: *See—*
Mills, Walter H.; and Bilbrey, Joseph T., Sr., 4,413,966., Cl. 425-84.000.

Biller, Bruce A., to S&C Electric Company. Contact assembly for a fuse cutout. 4,414,527., Cl. 337-180.000.

Billon, Alain; Renard, Pierre; Simandoux, Jean-Claude; and Heinrich, Gerard, to Institut Francais du Petrole. Process for deasphalting an asphaltene containing hydrocarbon charge. 4,414,105., Cl. 208-309.000.

Binz, Jorg: *See—*
Guth, Christian; and Binz, Jorg, 4,413,998., Cl. 8-477.000.

Bio-Rad Laboratories, Inc.: *See—*
Abrams, David E.; Curbelo, Raul; and Turner, R. Brough, 4,413,908., Cl. 356-346.000.

Bissell, Robert D., to Dresser Industries, Inc. Adjustably keyed pressure gauge construction. 4,413,529., Cl. 73-756.000.

Bittaker, Gerald W.; and Martinez, Evidio E., to Pearce, Charlie I. Toilet light unit. 4,413,364., Cl. 4-661.000.

Black Knight Investments Limited: *See—*
Ginsburg, Stephen J.; and Draheim, Frederick E., 4,413,979., Cl. 433-41.000.

Blaese, Herbert R.; and Lorenc, Christopher R., to Wilbert, Inc. Casket-placer and casket-lowering apparatus. 4,413,390., Cl. 27-32.000.

Blaschim S.p.A.: *See—*
Giordano, Claudio; Belli, Aldo; Uggeri, Fulvio; and Villa, Giovanni, 4,414,405., Cl. 560-56.000.

Blaudszun, Bernd, to Lohmann GmbH & Co., KG. Process and apparatus for the recovery of solvents. 4,414,003., Cl. 55-18.000.

Bleidt, Rolf; and Neumaier, Heinrich, to Brown, Boveri & Cie AG. Disconnect switch. 4,414,451., Cl. 200-148.00H.

Blevins, Earl L.; and Blevins, Joan V. Stirrup adjusting and locking device. 4,413,465., Cl. 54-46.000.

Blevins, Joan V.: *See—*
Blevins, Earl L.; and Blevins, Joan V., 4,413,465., Cl. 54-46.000.

Bliss, William R., to Thiokol Corporation. Extrusion die metering device. 4,413,968., Cl. 425-198.000.

Blonder, Alain, to Interlock Sicherheitssysteme GmbH. Method and apparatus for performing a comparison of given patterns, in particular fingerprints. 4,414,684., Cl. 382-4.000.

Blum, Samuel E.; Brown, Karen H.; and Srinivasan, Rangaswamy, to International Business Machines Corporation. Far UV patterning of resist materials. 4,414,059., Cl. 156-659.100.

Blytas, George C., to Shell Oil Company. Extraction process. 4,414,194., Cl. 423-573.00G.

BMA Laboratory Services, Inc.: *See—*
Stout, Robert L., 4,414,324., Cl. 435-7.000.

Boden, Richard M., to International Flavors & Fragrances Inc. Use of prins and derivatives thereof in augmenting or enhancing the aroma or taste of a smoking tobacco composition or smoking tobacco article component. 4,413,639., Cl. 131-276.000.

Bodenseewerk Perkin-Elmer & Co., GmbH: *See—*
Tomoff, Toma; Mohr, Hans G.; and Kempf, Volker, 4,413,534., Cl. 73-864.210.

Boehringer Mannheim GmbH: *See—*
Schrenk, Jurgen; and Wunderwald, Peter, 4,414,332., Cl. 435-219.000.

Boeing Company, The: *See—*
Armer, James P., 4,414,539., Cl. 340-500.000.
Duffy, Brian J.; Gratz, Eugene J.; Potter, Steven E.; and Power, Royal A., 4,414,171., Cl. 264-249.000.
Lubowitz, Hyman R.; and Sheppard, Clyde H., 4,414,269., Cl. 428-290.000.

Boettcher, Charles E.: *See—*
Klein, Thomas; Varadi, Andrew G.; and Boettcher, Charles E., 4,413,401., Cl. 29-571.000.

Bogner, Bruce F., to RCA Corporation. Broadband non-contacting RF shielding gasket. 4,414,425., Cl. 174-35.0GC.

Boise Cascade Corporation: *See—*
Lambuth, Alan L., 4,413,459., Cl. 52-729.000.

Boissevain, Mathew G.: *See—*
Rice, Richard G.; Boissevain, Mathew G.; and Dubin, Robert R., 4,413,911., Cl. 356-438.000.

Bollier, Willy, to Daverio A.G. Sorting conveyor for individual objects. 4,413,721., Cl. 198-365.000.

Bonnell, Ronald D.: *See—*
Summer, Charles F., Jr.; Pettus, Robert O.; Bonnell, Ronald D.; Huhns, Michael N.; and Stephens, Larry M., 4,414,624., Cl. 364-200.000.

Boorman, Robert G.: *See—*
Taylor, Verner L.; Sprowls, Joseph B., III; and Ayer, James R., 4,414,546., Cl. 340-825.300.

Borg-Warner Corporation: *See—*
Barr, Rodney E.; and Donovan, Daniel L., 4,414,163., Cl. 261-69.00A.

Falk, John C.; and Khait, Klementina F., 4,414,342., Cl. 523-437.000.
Lamarche, Paul E., 4,413,711., Cl. 192-3.280.
Borne, Andre; Vallod, Joseph; and Curvat, Rene, to Societe Anonyme dite: Cgee Alsthom. Fail-safe electrical connection terminal and tightening tool. 4,413,876., Cl. 339-244.00B.
Borneman, Paul R.: *See*—
Aggen, George; and Borneman, Paul R., 4,414,023., Cl. 75-124.000.
Bose, Ajit, to Leco Inc. Method for slitting and/or sealing plastic film material. 4,414,051., Cl. 156-198.000.
Bouffard, Michael L.; and Pejouhy, Radi, to Texas Instruments Incorporated. Miniature motor protector apparatus and method for assembling thereof. 4,414,530., Cl. 338-25.000.
Bourassa, Ronald R.; and Reeder, Michael R., to Inmos Corporation. Anisotropic silicide etching process. 4,414,057., Cl. 156-643.000.
Bousquet, Jean, to Societe Nationale Industrielle et Aerospetiale. Airfoil shape for aircraft. 4,413,796., Cl. 244-35.00R.
Bousquet, Jean-Claude. System for the transmission of digital data in packets. 4,414,662., Cl. 370-100.000.
Boutin, Xavier; Compagnon, Francis; and Poirier, Michel, to Societe D'Applications Generales D/Electricite et de Mecanique Sagem. Magnetic bubble memory devices. 4,414,646., Cl. 365-2.000.
Bouvet, Claude: *See*—
Terrien, Michel E.; and Bouvet, Claude, 4,413,369., Cl. 14-27.000.
Bowden, Wade R., Jr.: *See*—
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Bowman, William W., to Hoffman Controls Corporation. Air flow sensor. 4,413,514., Cl. 73-204.000.
Bowmar/ALI, Inc.: *See*—
Forrest, John W.; and DeFusco, Thomas, 4,413,880., Cl. 350-96.200.
Bown, Herbert G.; and O'Brien, C. Douglas, to Canadian Patents & Development Ltd. Interactive visual communications system. 4,414,621., Cl. 364-200.000.
Boyer, George C., to Barber-Colman Company. Reset controller with improved air flow span adjustment. 4,413,776., Cl. 236-49.000.
Boyer, Nicodemus E., to PPG Industries, Inc. Polyhalophthalimidoalkyl-functional carbonates and haloformates. 4,414,396., Cl. 548-478.000.
Boynton, Robert J.: *See*—
Baraff, David R.; Serinken, Nur M.; Streater, Richard W.; Miner, Carla J.; Boynton, Robert J.; MacLaurin, Blair K.; and Westwood, William D., 4,413,883., Cl. 350-334.000.
Bramlage GmbH: *See*—
Mettenbrink, Herbert, 4,413,759., Cl. 222-213.000.
Braun, Jack A.: *See*—
Davis, Edwin W.; and Braun, Jack A., 4,413,849., Cl. 292-229.000.
Braune, Dirk; and Schwartz, Wolfgang, to U.S. Philips Corporation. Circuit arrangement for extracting a field synchronizing signal from a television synchronizing signal. 4,414,570., Cl. 358-154.000.
Breault, Richard D., to United Technologies Corporation. Method for reducing electrolyte loss from an electrochemical cell. 4,414,291., Cl. 429-14.000.
Breda, Antoine G. L. J.; and Roussel, Jacques G. R., to P C U K Produits Chimiques Ugine Kuhlmann. Chromiferous complex dyestuffs, a process for their preparation and their application. 4,414,151., Cl. 260-145.00B.
Breed, Dirk J.; and Voermans, Antonius B., to U.S. Philips Corporation. Magnetic structure suitable for the propagation of single-walled magnetic domains. 4,414,290., Cl. 428-700.000.
Breidenbach, Dieter; and Mosebach, Wilhelm, to WSW Stahl-und Wasserbau GmbH. Door for coking chamber of coke-oven battery. 4,414,072., Cl. 202-248.000.
Breidenbach, Poul-Erik: *See*—
Bruning, Rolf; Breidenbach, Poul-Erik; Cibis, Norbert; Aldinger, Fritz; and Werdecker, Waltraud, 4,414,014., Cl. 65-31.000.
Brennan, William E.: *See*—
Gavagan, James A.; and Brennan, William E., 4,413,385., Cl. 24-230.00A.
Breslow, Jeffrey D., to Marvin Glass & Associates. Ball puzzle. 4,413,823., Cl. 273-153.00S.
Bringman, David J.: *See*—
Trufitt, Alton D.; and Bringman, David J., 4,414,061., Cl. 162-295.000.
Bristol-Myers Company: *See*—
Gordon, Maxwell; and Christie, George J., 4,414,206., Cl. 424-177.000.
Britax-Excelsior Limited: *See*—
Spalding, David N., 4,413,383., Cl. 24-164.000.
British Gas Corporation: *See*—
Churchill, David A., 4,414,633., Cl. 364-510.000.
British Petroleum Company Limited, The: *See*—
Webb, Alan D., 4,413,958., Cl. 417-424.000.
Broggi, Renato; and Falciani, Marco. Cephapirin acetylcysteinate having antibacterial activity. 4,414,387., Cl. 544-28.000.
Broken Hill Proprietary Company Limited, The: *See*—
Kobak, Joseph, 4,413,932., Cl. 406-138.000.
Brooker, Peter J.; and Goose, John, to Bayer AG. Anthelminthic pour-on veterinary composition. 4,414,222., Cl. 424-270.000.
Brother Industries, Ltd.: *See*—
Watanabe, Tomoyoshi; Hirayama, Takanobu; Yoshimura, Motokazu; Mizuno, Kenji; and Inukai, Yukio, 4,414,496., Cl. 318-696.000.
Brother Kogyo Kabushiki Kaisha: *See*—
Hirota, Kunio; and Shimomura, Masao, 4,413,574., Cl. 112-121.120.
Brouer, Robert L.: *See*—
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Brower, Gary M. Roof curb adapter. 4,413,450., Cl. 52-27.000.
Brown, Boveri & Cie AG: *See*—
Bleidt, Rolf; and Neumaier, Heinrich, 4,414,451., Cl. 200-148.00H.
Fischer, Wilfried, 4,414,297., Cl. 429-61.000.
Mennicke, Stefan; Reiss, Karl; and Liebermann, Kurt, 4,414,296., Cl. 429-50.000.
Brown Boveri Electric, Inc.: *See*—
Garzon, Ruben D., 4,414,445., Cl. 200-148.00A.
Garzon, Ruben D., 4,414,449., Cl. 200-146.00R.
Brown, Dennis N. Skate boot insert. 4,413,430., Cl. 36-44.000.
Brown, Dennis R.: *See*—
Murphy, John H.; Packer, Jon D.; and Brown, Dennis R., 4,414,200., Cl. 424-63.000.
Brown, Floyd A.: *See*—
Weaver, Charles S.; Chadwick, Joseph H.; Yarborough, John M., Jr.; Brown, Floyd A.; and Burch, Donald J., 4,414,587., Cl. 360-76.000.
Brown, George T. Pipe repair bypass system. 4,413,655., Cl. 138-97.000.
Brown, Karen H.: *See*—
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Brown, Stanley F.: *See*—
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Brown, Trevor P., to Pandrol Limited. Rail clip and an assembly on a railway track which includes the clip. 4,413,777., Cl. 238-349.000.
Brown, Worthy H. Slug for a shotgun shell. 4,413,564., Cl. 102-501.000.
Brunet, Michel, to Etablissements Valois. Metered aerosol valve for use in inverted position. 4,413,755., Cl. 222-402.200.
Bruning, Rolf; Breidenbach, Poul-Erik; Cibis, Norbert; Aldinger, Fritz; and Werdecker, Waltraud, to Heraeus Quarzschmelze GmbH. Method of producing a bubble-free vitreous material. 4,414,014., Cl. 65-31.000.
Bruno, Edward D.; and Bruno, Gary C. Potted plant package. 4,413,725., Cl. 206-45.330.
Bruno, Gary C.: *See*—
Bruno, Edward D.; and Bruno, Gary C., 4,413,725., Cl. 206-45.330.
Bubley, Henry J., to American Screen Printing Equipment Company. Multi-speed drive for screen printing presses. 4,413,559., Cl. 101-123.000.
Bucchianeri, Bernard A., to United States Steel Corporation. Process for separation of gas mixture. 4,414,007., Cl. 62-12.000.
Buchholz, Rainer; Tomashausser, Josef; Zodrow, Rudolf; and Mohn, Hans-Werner, to Jagenberg Werke AG. Method and apparatus for foil-capping bottles. 4,414,056., Cl. 156-476.000.
Buchin, Michael: *See*—
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Buckner, Guy O., to Dresser Industries, Inc. Integrated well logging system and method. 4,414,651., Cl. 367-27.000.
Buda, Charles: *See*—
Liebowitz, Marvin; and Buda, Charles, 4,414,144., Cl. 252-548.000.
Buechler, Peter R.: *See*—
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Buhler, Allen C.: *See*—
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Buhlmann, Niklaus: *See*—
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Burge, Russell W., to Mobay Chemical Corporation. Foam peeling process and apparatus. 4,413,540., Cl. 82-47.000.
Burlington Industries, Inc.: *See*—
Baldwin, A. Frank, 4,414,268., Cl. 428-289.000.
Wang, Kenneth Y.; Hill, Berlie R.; and Pinson, Marvin J., Jr., 4,414,045., Cl. 156-73.200.
Burnell, Elvin W.; and Deschner, David. Window security device. 4,413,852., Cl. 292-259.000.
Burnham, Francis L., to Orangeburg Technologies, Inc. Small temperature differential heat-powered compressor. 4,413,952., Cl. 417-253.000.
Burns, Carmen D., to National Semiconductor Corporation. Process for manufacturing a tear strip planarization ring for gang bonded semiconductor device interconnect tape. 4,413,404., Cl. 29-590.000.
Burns, Walter G.: *See*—
Pitts, Elvin C.; Burns, Walter G.; and Anderson, Harvey R., 4,413,618., Cl. 126-450.000.
Burroughs Corporation: *See*—
Harvey, Edgar L., 4,414,490., Cl. 315-169.400.
Miller, Christopher F., 4,414,625., Cl. 364-200.000.

Peter, Emmett B., III; and Rayfield, Wilson P., 4,413,902., Cl. 355-48.000.
Romania, Samuel R.; and Watson, Frank L., 4,413,413., Cl. 30-300.000.
Burroughs Wellcome Co.: *See—*
Copp, Frederick C.; Roberts, Peter T.; Frenkel, Alexander D.; and Collard, David, 4,414,223., Cl. 424-273.00R.
Burry, Stephen W., to CTS Corporation. Apparatus for producing uniform density and weight briquettes. 4,413,967., Cl. 425-149.000.
Burtelson, Frederick W., to Northern Telecom Inc. Aerial cable terminal. 4,414,426., Cl. 174-59.000.
Bushman, James B.: *See—*
Waits, Charles G.; Nicholas, Karl W.; and Bushman, James B., 4,414,511., Cl. 324-347.000.
Butterworth, Arthur L., to Trane Company, The. Scroll machine with flex member pivoted swing link. 4,413,959., Cl. 418-14.000.
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Byk-Millinkcrodt CIL B.V.: *See—*
Panek, Karel J., 4,414,145., Cl. 252-645.000.
Cabardo, Alberto M., Jr. Periodontal powder containing exsiccated potassium alum. 4,414,203., Cl. 424-154.000.
Calandra, Frank, Jr., to Jennmar Corporation. Method and apparatus for combining resin bonding and mechanical anchoring of a bolt in a rock formation. 4,413,930., Cl. 405-261.000.
Callihan, Rudy B.; and Wainwright, Clyde, to Baker Oil Tools, Inc. Method and apparatus for installing a cementing float shoe on the bottom of a well casing. 4,413,682., Cl. 166-382.000.
Cameron, Donald S.; and Cooper, Susan J., to Johnson, Matthey & Co., Limited. Electrode. 4,414,071., Cl. 204-242.000.
Camus, Annamaria: *See—*
Mestroni, Giovanni; Zassinovich, Grazia; and Camus, Annamaria, 4,414,417., Cl. 568-315.000.
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Hill, Eugene E.; Scrimshaw, Marvin S.; and Showalter, Edward W., 4,414,654., Cl. 367-103.000.
Candor, James T. Method for thermal/vacuum drying a wet web of material. 4,413,425., Cl. 34-1.000.
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Kato, Yuzo; Ishihara, Shunichi; Sato, Yasushi; Tanaka, Nobuyoshi; Kawamura, Naoto; and Nakatsui, Hisashi, 4,414,581., Cl. 358-280.000.
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Shirai, Shigeru; Kanbe, Junichiro; and Fukuda, Tadaji, 4,414,319., Cl. 430-65.000.
Cantrel, James F.: *See—*
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Capasso, Ursula, to Exquisite Form Industries, Inc. Foundation garment. 4,413,626., Cl. 128-498.000.
Carini, Edward. Game ball holder. 4,413,762., Cl. 224-250.000.
Carl Freudenberg, Firma: *See—*
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Carlson, Franklin B.: *See—*
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Carpenter, Daniel D.; and Lanning, Ronald L., to TRW Inc. Doppler speed sensing apparatus. 4,414,548., Cl. 343-8.000.
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Bex, Guy, deceased; Bex, Josette, legal representative; and Carsoule, Yve, 4,414,343., Cl. 523-440.000.
Carter, Ernest E., Jr., to Halliburton Company. Inflation anchor. 4,413,653., Cl. 138-89.000.
Cartwright, David; and Turnbull, Michael, to Imperial Chemical Industries PLC. A process for preparing 2-pyridinyloxyphenoxy-loweralkanoates. 4,414,391., Cl. 546-302.000.
Caselt - Centro Studi e Laboratori Telecomunicazioni S.p.A.: *See—*
Roba, Giacomo; and Vergnano, Paolo, 4,414,164., Cl. 264-1.200.
Casio Computer Co., Ltd.: *See—*
Iba, Akio, 4,413,543., Cl. 84-1.030.
Caterpillar Tractor Co.: *See—*
Stedman, Robert N., 4,413,708., Cl. 187-9.00R.
Cavanagh, Peter R., to PUMA-Sportschuhfabriken Rudolf Dassler KG. Athletic shoe upper construction. 4,413,431., Cl. 36-114.000.
Celanese Corporation: *See—*
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Costanza, John R.; and Trapasso, Louis E., 4,414,250., Cl. 427-386.000.
Williams, Albert G., 4,414,341., Cl. 523-340.000.
Centafanti, Rocco. Treadmill exerciser. 4,413,821., Cl. 272-69.000.
Centre d'Etudes et de Recherches de la Machine-Outil (C.E.R.M.O.): *See—*
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Centre National d'Etudes et d'Experimentation de Machinisme Agricole: *See—*
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Cerwin, Robert J.; and Alpern, Marvin, to Ethicon Inc. Folder retainer for surgical sutures. 4,413,727., Cl. 206-63.300.
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Chan, David C. K., to Chevron Research Company. Herbicidal 3-butyrolactones. 4,414,017., Cl. 71-88.000.
Chan, Hak-Foon: *See—*
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Chan, Keat-Lye: *See—*
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Chaparral Communications, Inc.: *See—*
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Charlson, Paul M.; Schwieters, Clarence R.; and Souk, Jun H., to International Business Machines Corporation. Laser joining of thermoplastic and thermosetting materials. 4,414,166., Cl. 264-25.000.
Chaudhari, Dalsang K.: *See—*
Michael, Richard A.; Chaudhari, Dalsang K.; and Marquart, Gordon L., 4,413,715., Cl. 192-53.00F.
Chemische Werke Huels Aktiengesellschaft: *See—*
Keil, Hans S. H., deceased; Alfs, Helmut; and Schulze, Klaus, 4,414,125., Cl. 252-75.000.
Chen, Thomas T., to Rockwell International Corporation. Copper embedded ferrite coil arrangement for supplying uniform rotating field in full frequency range for testing magnetic bubble devices. 4,414,507., Cl. 324-210.000.
Cheng, Bao-ding, to Colgate Palmolive Company. Readily disintegrable agglomerates of insoluble detergent builders and detergent compositions containing them. 4,414,130., Cl. 252-140.000.
Chester, Arthur W.; and Garwood, William E., to Mobil Oil Corporation. Catalytic process for manufacture of low pour lubricating oils. 4,414,097., Cl. 208-59.000.
Chevron Research Company: *See—*
Chan, David C. K., 4,414,017., Cl. 71-88.000.
Farrell, Thomas R., 4,414,103., Cl. 208-212.000.
Harrison, Jonas P., 4,414,185., Cl. 423-163.000.
Krug, Russell R.; and Hohmann, Robert P., 4,414,100., Cl. 208-153.000.
Miller, Stephen J., 4,414,423., Cl. 585-517.000.
Sigworth, Harry W., Jr., 4,413,615., Cl. 126-434.000.
Chianco, Bernard V.; Chianco, John B.; and Chianco, David B. Sit-down shower for children. 4,413,362., Cl. 4-567.000.
Chianco, David B.: *See—*
Chianco, Bernard V.; Chianco, John B.; and Chianco, David B., 4,413,362., Cl. 4-567.000.
Chianco, John B.: *See—*
Chianco, Bernard V.; Chianco, John B.; and Chianco, David B., 4,413,362., Cl. 4-567.000.
Chicago Bridge & Iron Company: *See—*
Sims, James E.; and Schmick, Robert C., 4,414,459., Cl. 219-73.200.
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Wallace, William K.; Giardino, David A.; and Groshans, Joseph R., 4,413,396., Cl. 29-407.000.
Chicopee: *See—*
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Chida, Takeshi: *See—*
Akita, Shuichi; Chida, Takeshi; Watanabe, Hiroyuki; and Ueda, Akio, 4,414,363., Cl. 525-237.000.
Chihara, Yasuaki: *See—*
Kawakita, Takeshi; Chihara, Yasuaki; Fukuda, Takemi; Setoguchi, Michihide; and Tahara, Tetsuya, 4,414,216., Cl. 424-251.000.
Chikaraishi, Takayo, to Nissan Motor Company, Limited. Guide rail for a sliding door. 4,413,444., Cl. 49-409.000.
Chin, John F.; Rhodes, Joseph A.; and Kusterer, James E., to Manville Service Corporation. Apparatus for attenuating mineral fibers. 4,414,010., Cl. 65-16.000.
China Steel Corporation: *See—*
Yang, Chi-Ming, 4,414,025., Cl. 75-129.000.
Ching, Ta-Yen: *See—*
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Chino, John J.; LePage, Paul; Rossi, Robert M.; and Rossman, Herman, to United States of America, Navy. Positive locking mechanism. 4,414,605., Cl. 361-388.000.
Chloe Chimie: *See—*
Bernelin, Daniel; and Meyer, Jacques, 4,414,279., Cl. 428-413.000.
Chloride Silent Power Limited: *See—*
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Cho, Hyun J.: *See—*
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Choe, Eui W.: *See—*
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Choudhury, Abu N. M. M.: *See—*
Tabatabaie-Alavi, Kamal; Choudhury, Abu N. M. M.; Gabriel, Nancy J. (Slater); and Fonstad, Clifton G., 4,414,076., Cl. 204-15.000.
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Gordon, Maxwell; and Christie, George J., 4,414,206., Cl. 424-177.000.
Christy, Marcia E.: *See—*
Anderson, Paul S.; Christy, Marcia E.; Evans, Ben E.; and Remy, David C., 4,414,154., Cl. 260-245.700.

Chudy, John S.: *See—*
Shoji, Robert M.; and Chudy, John S., 4,414,655., Cl. 369-44.000.
Churchill, David A., to British Gas Corporation. Data processing and recording apparatus. 4,414,633., Cl. 364-510.000.
Ciba-Geigy AG: *See—*
Scherrer, Walter; and Portmann, Robert, 4,414,156., Cl. 260-352.000.
Ciba-Geigy Corporation: *See—*
Andrews, Christopher M., 4,414,377., Cl. 528-88.000.
Dexter, Martin; and Winter, Roland A. E., 4,414,393., Cl. 548-260.000.
Guth, Christian; and Binz, Jorg, 4,413,998., Cl. 8-477.000.
Habicht, Ernst; and Zbinden, Paul, 4,414,214., Cl. 424-248.510.
Iqbal, Abul; and Lienhard, Paul, 4,414,395., Cl. 548-471.000.
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Tarcsay, Lajos; Baschang, Gerhard; Hartmann, Albert; and Stanek, Jaroslav, 4,414,204., Cl. 424-177.000.
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Claxton, Kenneth W.; and Harris, Lewis K., to Combustion Engineering, Inc. System for dampening pulsations or oscillations in a force-balance instrument. 4,413,523., Cl. 73-701.000.
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Clevenson, Sherman A.: *See—*
Leatherwood, Jack D.; Dempsey, Thomas K.; Clevenson, Sherman A.; and Stephens, David G., 4,413,522., Cl. 73-646.000.
Cliff, John W., Jr., to John Morrell & Co. Meat processing apparatus. 4,413,375., Cl. 17-1.00R.
Clifft, Dale L. Power assisting device for a manually operable vehicle. 4,413,692., Cl. 180-11.000.
Cline, Harvey E., to General Electric Company. Method for making surface acoustic wave devices. 4,414,243., Cl. 427-100.000.
Cloutier, Louis. Electrical water heating device with improved internal circulation. 4,414,464., Cl. 219-312.000.
Cluniat, Claude; and Dominguez, Mariano, to L.G.T. Laboratoire General des Telecommuniqations. Device for the measurement, in operation, of non-linearity products in a television transmitter. 4,414,568., Cl. 358-139.000.
Cobbledick, David S.; Reichenbach, Donald F.; and Shanoski, Henry, to General Tire & Rubber Company, The. In-mold coating. 4,414,173., Cl. 264-257.000.
Cockeram, John M. Apparatus for and a method of selective plating of components including strip components. 4,414,075., Cl. 204-15.000.
Coe, Anthony D., to David Brown Tractors Ltd. Tractor front loader with locking strut. 4,413,944., Cl. 414-685.000.
Coflexip: *See—*
N'Guyen Duc, Xuong; and Szabo, Rene, 4,413,844., Cl. 285-16.000.
Cohen, Abraham B.; and Lazaridis, Christina N., to Du Pont de Nemours, E. I., and Company. Crosslinked triacrylate polymer beads. 4,414,278., Cl. 428-402.000.
Cohen, Ellen R.: *See—*
Schlanger, Samuel L., 4,413,702., Cl. 180-274.000.
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Timberlake, John R.; Ruzic, David N.; Moore, Richard L.; Cohen, Samuel A.; and Manos, Dennis M., 4,414,244., Cl. 427-105.000.
Cohen, Stuart C.; Kostelnik, Robert J.; and Wambach, Allen D., to General Electric Company. Thermoplastic molding compositions and process. 4,414,352., Cl. 524-443.000.
Colgate Palmolive Company: *See—*
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Collard, David: *See—*
Copp, Frederick C.; Roberts, Peter T.; Frenkel, Alexander D.; and Collard, David, 4,414,223., Cl. 424-273.00R.
Colle, Roberto; Gozzo, Franco; and Prezіuso, Ciro, to Montedison S.p.A. Herbicides. 4,414,018., Cl. 71-88.000.
Collin, Gerd: *See—*
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Smitley, Marion L., 4,413,603., Cl. 123-510.000.
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Columbus, Richard L., to Eastman Kodak Company. Method for forming an electrode-containing device with capillary transport between electrodes. 4,413,407., Cl. 29-825.000.
Combustion Engineering, Inc.: *See—*
Claxton, Kenneth W.; and Harris, Lewis K., 4,413,523., Cl. 73-701.000.
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Commissariat a l'Energie Atomique: *See—*
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Compagnie Francaise des Aciers Speciaux: *See—*
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Companie Universelle d'Acetylene et d'Electrometallurgie: *See—*
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Comroe, Richard A., to Motorola, Inc. MSK and OK-QPSK signal demodulator. 4,414,675., Cl. 375-90.000.
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Conciatori, Anthony B.; Choe, Eui W.; and Hall, Henry K., Jr., to Celanese Corporation. High molecular weight polybenzimidazole preparation with phosphorus containing polymerization catalyst. 4,414,383., Cl. 528-336.000.
Conforti, Frederick J.; and Fenne, Kenneth R., to Pittway Corporation. Hand-held light with means for controlling beam width. 4,414,612., Cl. 362-188.000.
Conley, Kenneth E., to Rexham Corporation. Composite lenticular screen sheet. 4,414,316., Cl. 430-496.000.
Connell, David A. Method of making black glass by utilizing incinerated waste glass. 4,414,013., Cl. 65-28.000.
Conoco Inc.: *See—*
Convers, Ronald J., 4,414,136., Cl. 502-225.000.
Conrad, James R. Apparatus for twist-tying ceiling hangers from joists. 4,413,660., Cl. 140-119.000.
Conrad, Walter W.; and Hebert, James G., Jr. Battery operated hydraulic vehicle. 4,413,698., Cl. 180-305.000.
Conroy, Ernest F., Jr., to Westinghouse Electric Corp. Solid-state load protection system having a test feature. 4,414,601., Cl. 361-97.000.
Constein, Ronald L., to Allied Corporation. Formed separator set for lead acid batteries. 4,414,301., Cl. 429-136.000.
Container Corporation of America: *See—*
Michetti, Louis C., 4,413,769., Cl. 229-27.000.
Conti, Jack, to Dresser Industries, Inc. Bourdon tube construction. 4,413,525., Cl. 73-741.000.
Continental Can Company, Inc.: *See—*
Kubis, Charles S.; and Walter, John, 4,413,497., Cl. 72-356.000.
Continental Plastics: *See—*
Stroud, Ray D., 4,413,745., Cl. 220-23.400.
Convers, Ronald J., to Conoco Inc. Catalysts for ethylene oxychlorination. 4,414,136., Cl. 502-225.000.
Cook, Peter B.; and Hunt, John H., to Allen & Hanburys Limited. Micronized aerosol steroids. 4,414,209., Cl. 424-243.000.
Cook, Ronald, to Tools & Machinery Builders, Inc. Can or tube adhesive applicator. 4,413,587., Cl. 118-210.000.
Cooper, Neil A., to Lucas Industries Limited. Resistance measuring system. 4,413,917., Cl. 374-173.000.
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Coplan, Myron J.; Park, Chunghi H.; and Williams, Samuel C., to Albany International Corp. Chlorosulfonated polysulfones and derivatives thereof. 4,414,368., Cl. 525-534.000.
Copp, Frederick C.; Roberts, Peter T.; Frenkel, Alexander D.; and Collard, David, to Burroughs Wellcome Co. Pesticidal anilinomethylimidazolines. 4,414,223., Cl. 424-273.00R.
Coran, Aubert Y.; and Goettler, Lloyd A., to Monsanto Company. Method for treating discontinuous cellulose fibers characterized by specific polymer to plasticizer and polymer-plasticizer to fiber ratios, fibers thus treated and composites made from the treated fibers. 4,414,267., Cl. 428-288.000.
Corbin, James R., Sr. Turn-up tape. 4,414,258., Cl. 428-193.000.
Corcoran, Sean. Device for preventing overwinding of a roller blind. 4,413,665., Cl. 160-315.000.
Cordis Dow Corp.: *See—*
Geel, Zane H.; Hornby, Roger B.; Lipps, Bennie J.; Savage, Charles E.; and Vanat, Pierre, 4,414,110., Cl. 210-321.300.
Cornelius Company, The: *See—*
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Cornell Research Foundation, Inc.: *See—*
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Bailey, Alan C.; and Morrow, Alan J., 4,413,882., Cl. 350-96.300.
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Cornu, Jean; Detriche, Jean-Marie; Tiret, Bernard; Jorge, Gerard; Galera, Richard; Biava, Dominique; and Marchal, Paul, to Commissariat a l'Energie Atomique. System for detecting and locating surface discontinuity by a light beam. 4,413,910., Cl. 356-377.000.
Corona, Stephen C.; and Urso, Charles J., Jr., to Xerox Corporation. Document illumination system. 4,413,903., Cl. 355-68.000.

Cossette, Michael D.: *See—*
Tenold, Tyrus N.; Cossette, Michael D.; Kuntz, James P.; and Gordon, Jack D., 4,413,747., Cl. 220-225.000.
Costanza, John R.; and Trapasso, Louis E., to Celanese Corporation. Amine containing resin with oxalate esters for casting. 4,414,250., Cl. 427-386.000.
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Cottman, Kirkwood S., to Goodyear Tire & Rubber Company, The. Phenolic antioxidants. 4,414,408., Cl. 560-144.000.
Covini, Romano: *See—*
DeAlberti, Giordano; Covini, Romano; Padovan, Mario; Battiston, Giancarlo; and Petrini, Guido, 4,414,412., Cl. 562-535.000.
Cowley, Gerald: *See—*
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Crawford, Alexander, to Massey-Ferguson Industries Limited. Baler. 4,413,553., Cl. 100-4.000.
Crawford, David J.; and Meeker, Robert G., to International Business Machines Corporation. Apparatus and method for precisely positioning an object. 4,413,399., Cl. 29-428.000.
Crewe, Albert V., to University Patents, Inc. Corrector for axial aberrations in electron optic instruments. 4,414,474., Cl. 250-396.00R.
Crewes, Rickard N.: *See—*
Seabase, Peter P.; and Crewes, Rickard N., 4,413,645., Cl. 137-223.000.
Creze, Patrick: *See—*
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Crichlow, Charles A.: *See—*
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Guadagnin, Laurent J.; and Grossiord, Claude R., 4,413,530., Cl. 73-861.470.
Crist, Scott D., to Honeywell, Inc. Ultrasonic line sensor. 4,414,652., Cl. 367-93.000.
Critikon, Inc.: *See—*
Schlessinger, Joseph E.; and Hamilton, Richard G., 4,413,632., Cl. 128-716.000.
Croom, Robert E., Jr.; and Jeter, John D., to Oil-Well Drilling Control, Inc. Oil well service tool. 4,413,516., Cl. 73-431.000.
Cryomedics, Inc.: *See—*
Durley, Benton A., III, 4,413,629., Cl. 128-660.000.
CTS Corporation: *See—*
Burry, Stephen W., 4,413,967., Cl. 425-149.000.
Cuckson, Harry; and Curtis, Peter D., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Microwave instantaneous frequency measurement apparatus. 4,414,505., Cl. 324-85.000.
Culp, Charles R.; Emmons, Larrimore B.; and Lewicki, Walter J., Jr., to Armstrong World Industries, Inc. Transparency, a method for forming it and a photographic mask whose optical densities are correlated with the contour of a surface. 4,414,317., Cl. 430-4.000.
Cumberland Packing Corp.: *See—*
Bakal, Abraham I.; and Buhler, Allen C., 4,414,229., Cl. 426-98.000.
Cummins Engine Company, Inc.: *See—*
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Curbelo, Raul: *See—*
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Cuckson, Harry; and Curtis, Peter D., 4,414,505., Cl. 324-85.000.
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Cutter Laboratories, Inc.: *See—*
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D'Agostino, Vincent F.; and Lee, Joseph Y., to RAI Research Corporation. Separator membranes for redox-type electrochemical cells. 4,414,090., Cl. 204-252.000.
Daicel Ltd.: *See—*
Suzuki, Hajime; Masuda, Ikuo; and Kosaka, Masaki, 4,414,351., Cl. 524-413.000.
Daimler-Benz Aktiengesellschaft: *See—*
Klak, Roland; Frankle, Gerhard; and Woschee, Dieter, 4,413,606., Cl. 123-550.000.
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Quinn, Leonard L., 4,413,515., Cl. 73-296.000.
Dattilo, Anthony J.; McDonald, James F.; and Queener, Carl A., to International Business Machines Corporation. Information transmitting and receiving station utilizing a copier-printer. 4,414,579., Cl. 358-256.000.
Daubendiek, Richard L.; and Strong, Ronald W., to Eastman Kodak Company. Process for the preparation of high aspect ratio silver bromoiodide emulsions. 4,414,310., Cl. 430-567.000.
Daugherty, Donald L. Coffee making machine. 4,413,552., Cl. 99-295.000.
Dausinger, Friedrich; Muller, Werner; and Arnold, Peter, to Arnold, Peter. Laser beam surface treatment process for materials of large reflectivity. 4,414,038., Cl. 148-4.000.
Daverio A.G.: *See—*
Bollier, Willy, 4,413,721., Cl. 198-365.000.
David Brown Tractors Ltd.: *See—*
Coe, Anthony D., 4,413,944., Cl. 414-685.000.
Scott, Brian; and Duncan, Robert, 4,414,533., Cl. 340-52.00R.
Davidson, Thomas L., to Robertson Paper Box Co., Inc. Display box. 4,413,726., Cl. 206-45.130.
Davis, Edwin W.; and Braun, Jack A., to Eastern Company, The. Tool-operated flush-mountable latch. 4,413,849., Cl. 292-229.000.
Davis, Frank N.; and Podgurski, Harry H., to United States Steel Corporation. Continuous decarburization annealing with recycle to convert carbon monoxide. 4,414,043., Cl. 148-16.000.
Davis, Hubert B.; Staff, Bonner W.; and Willis, James A., to Lockheed Corporation. Method and apparatus for automated inspection of fastener holes by eddy current. 4,414,508., Cl. 324-238.000.
Davis, Walter L.; and Jacobson, James E., Jr., to Motorola, Inc. Dual deadman timer circuit. 4,414,623., Cl. 364-200.000.
Davy McKee (Oil & Chemicals) Limited: *See—*
Harris, Norman; Dennis, Alan J.; and Harrison, George E., 4,414,420., Cl. 568-454.000.
Dayco Corporation: *See—*
Foster, Randy C., 4,413,982., Cl. 474-138.000.
Wetzel, Robert E.; and Marsh, Richard L., 4,414,047., Cl. 156-138.000.
De Laire, Inc.: *See—*
Santini, Thomas F., 4,413,779., Cl. 239-45.000.
Dea, Jack Y., to United States of America, National Aeronautics and Space Administration. Constant-output atomizer. 4,413,784., Cl. 239-426.000.
DeAlberti, Giordano; Covini, Romano; Padovan, Mario; Battiston, Giancarlo; and Petrini, Guido, to Montedison S.p.A. Process for the preparation of unsaturated carboxylic acids by the catalytic oxidation in gaseous phase of the corresponding aldehydes and catalyst used in said process. 4,414,412., Cl. 562-535.000.
Dean, Edward E.: *See—*
Tomlinson, Samuel J., Sr.; Dean, Edward E.; and Adams, Leon M., 4,414,227., Cl. 424-331.000.
Dean, Gilbert J.; and White, Loren H., to General Electric Company. Liner assembly for gas turbine combustor. 4,413,477., Cl. 60-757.000.
Dean, Robert, to Mars, Inc. Method and apparatus for detecting the presence of a coin in a passageway. 4,413,718., Cl. 194-1.00K.
De Bievre, Paul J.; Vansant, Etienne F.; and Peeters, Guido J., to European Atomic Energy Community (Euratom). Method of encapsulating materials in a zeolite in a stable manner. 4,414,005., Cl. 55-75.000.
Decker, Harry J.; and Thorsteinson, Erlind M., to Union Carbide Corporation. Process for preparing unsaturated acids with Mo, V, Ti-containing catalysts. 4,414,411., Cl. 562-534.000.
DeCoste, Stephen H., to Midland-Ross Corporation. Waterproof electrical switch with safety interlock. 4,414,440., Cl. 200-50.00B.
Deepsea Ventures, Inc.: *See—*
Latimer, John P., 4,413,925., Cl. 405-195.000.
Deere & Company: *See—*
Michael, Richard A.; Chaudhari, Dalsang K.; and Marquart, Gordon L., 4,413,715., Cl. 192-53.00F.
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DeFusco, Thomas: *See—*
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Olivieri, Roberto; Robertiello, Andrea; and Degen, Ludwig, 4,414,333., Cl. 435-243.000.
Deguchi, Toshihisa: *See—*
Ohta, Kenji; Takahashi, Akira; and Deguchi, Toshihisa, 4,414,650., Cl. 365-122.000.
Deike, Robert F.: *See—*
Lane, Vern E., 4,413,907., Cl. 356-141.000.
de Jong, Gerrit, to Societe Anonyme Francaise du Ferodo. Stator for rotating electric machine. 4,414,481., Cl. 310-42.000.
Delajoud, Pierre, to Desranges & Huot. Device for accurately measuring fluid pressure with display of the measured pressure. 4,413,526., Cl. 73-745.000.
Delaney, Dennis D.; and Fenton, Donald M., to Union Oil Company of California. Process for removal of metals from hydrocarbon oils. 4,414,104., Cl. 208-251.00R.
Delio, Ralph D.: *See—*
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Diemer, Donald J.; and Delio, Ralph D., 4,413,499., Cl. 72-446.000.
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Raphael, Richard A.; Eyley, Stephen C.; and Coltman, Stephen C. W., 4,414,416., Cl. 564-443.000.
Fabris, Hubert J.: *See*—
Lenke, Gerd M.; and Fabris, Hubert J., 4,414,362., Cl. 525-178.000.
Facet Enterprises, Incorporated: *See*—
Wiernicki, Michael V., 4,413,950., Cl. 417-53.000.
Faiveley S.A.: *See*—
Milleville, Andre, 4,413,710., Cl. 191-70.000.
Falciani, Marco: *See*—
Broggi, Renato; and Falciani, Marco, 4,414,387., Cl. 544-28.000.
Fales, Douglas I., to General Motors Corporation. Two-stage hydraulic piston pump. 4,413,953., Cl. 417-262.000.
Falk Corporation, The: *See*—
Walloch, Richard G., 4,413,980., Cl. 464-82.000.
Falk, John C.; and Khait, Klementina F., to Borg-Warner Corporation. Glass-filled thermoplastic resins. 4,414,342., Cl. 523-437.000.
Falk, Volker: *See*—
Weber, Jurgen; Falk, Volker; and Kniep, Claus, 4,414,419., Cl. 568-421.000.
Farm, Kari M. U.: *See*—
Peuhkurinen, Eino J.; Linnanketo, Erkki J.; Farm, Kari M. U.; Kivisto, Tuomo V. J.; Koho, Tauno T.; Kinnunen, Seppo T.; and Taskinen, Martti P., 4,413,495., Cl. 72-196.000.
Farmer, Paul L.; Gibeau, Frank C.; Brown, Stanley F.; and Plonczak, Garold W., to Atasi Corporation. Linear actuator for a memory storage apparatus. 4,414,594., Cl. 360-106.000.
Farmitalia Carlo Erba: *See*—
Pellegata, Renato; and Gandolfi, Carmelo, 4,414,407., Cl. 424-305.000.
Farnham, William B.; and Sogah, Dotsevi Y., to Du Pont de Nemours, E. I., and Company. Process for preparing living polymers. 4,414,372., Cl. 526-190.000.
Farquhar, Robert L.; and Ball, David N., to Graviner Limited. Two channel comparison-type fire or explosion detecting system. 4,414,542., Cl. 340-578.000.
Farr, Aaron V., to Abex Corporation. Vertical descent rate detector switch. 4,414,518., Cl. 335-205.000.
Farrar, Ralph C.: *See*—
Senatore, Guy; and Farrar, Ralph C., 4,414,340., Cl. 523-219.000.
Farrell, Thomas R., to Chevron Research Company. Selective removal and recovery of ammonia and hydrogen sulfide. 4,414,103., Cl. 208-212.000.
Faye, Lloyd H. Motorized system for cleaning drain troughs. 4,413,449., Cl. 52-16.000.
FBC Limited: *See*—
Parsons, John H.; and West, Peter J., 4,414,221., Cl. 424-269.000.
Feairheller, Stephen H.: *See*—
Milligan, Brian; Buechler, Peter R.; and Feairheller, Stephen H., 4,413,997., Cl. 8-94.210.
Featherstone, Harry E.; and Steffen, Alvin R., to Will-Burt Company, The. Pneumatically actuated tilting telescoping mast construction. 4,413,451., Cl. 52-28.000.
Feldman, Sidney; and Barton, George G., Jr., to United States of America, Navy. Passive optical rangefinder/sextant having search capability. 4,413,906., Cl. 356-141.000.
Fellner, Theodore F., to Mapatent, N.V. Horizontal accumulator. 4,413,724., Cl. 198-594.000.
Felten, John J., to Du Pont de Nemours, E. I., and Company. Conductor compositions. 4,414,143., Cl. 252-514.000.
Fenne, Kenneth R.: *See*—
Conforti, Frederick J.; and Fenne, Kenneth R., 4,414,612., Cl. 362-188.000.
Fenton, Donald M.: *See*—
Delaney, Dennis D.; and Fenton, Donald M., 4,414,104., Cl. 208-251.00R.
Ferdinand, Irwin J.; Sylvan, Richard; and Peterson, Michael, to Hirsh Company. Three piece knob assembly including a cap. 4,413,374., Cl. 16-121.000.
Ferix Corporation: *See*—
Springer, Gilbert D., 4,414,554., Cl. 346-74.500.
Fernandez, David; and Fernandez, Helena J., to American Sports Equipment. Elastic core composite structure and method of making same. 4,413,822., Cl. 273-73.00C.
Fernandez, Helena J.: *See*—
Fernandez, David; and Fernandez, Helena J., 4,413,822., Cl. 273-73.00C.
Ferrato, Joseph P., to Eaton Corporation. Casting a thermoplastic-alkali earth metal salt reflector to a liquid crystal display. 4,413,884., Cl. 350-338.000.
Ferretti, James: *See*—
Meinsen, Edward; and Ferretti, James, 4,413,493., Cl. 70-422.000.
Ferrieu, Gilbert M. M.; Osmond, Etienne J. R.; and Hetet, Yves J. F., to Telecommunications Radioelectriques et Telephoniques T.R.T. Electronic subscriber line interface circuit having means to equalize current through the output differential amplifier. 4,414,434., Cl. 179-77.000.
Ferriss, Lincoln S., to Singer Company, The. Magnetic resonance gyro signal processor. 4,414,535., Cl. 340-347.0AD.
Fiat Auto S.p.A.: *See*—
Piano, Renzo, 4,413,550., Cl. 98-2.000.
Fiber Industries, Inc.: *See*—
McClary, Edward B., 4,414,169., Cl. 264-210.700.
Ficca, Vincent G., to Joseph E. Seagram & Sons, Inc. Special natural wines simulative of liqueurs. 4,414,231., Cl. 426-271.000.
Fidock, Robert J. Method of retrieving and securing anchors, fish traps and lobster pots. 4,413,381., Cl. 24-131.00C.
Field, Harold: *See*—
Williamson, Thomas R., III; Jones, Beth B.; Field, Harold; and Stephenson, Robert F., 4,414,303., Cl. 429-217.000.
Fields, Ellis K., to Standard Oil Company (Indiana). Class of Friedel-crafts catalysts. 4,414,406., Cl. 560-109.000.
Filtertek, Inc.: *See*—
Leason, Hayden L., 4,414,172., Cl. 264-255.000.
Finkle, Louis J. Portable power driven wire puller. 4,413,808., Cl. 254-134.3FT.
Firestone Tire & Rubber Company, The: *See*—
Dougherty, David J.; Gunesin, Binnur; and Spiewak, John W., 4,414,359., Cl. 524-555.000.
Gunesin, Binnur; and Halasa, Adel E., 4,414,374., Cl. 526-217.000.
Fisch, Klaus: *See*—
Zucker, Friedrich J.; Osthaus, Georg; and Fisch, Klaus, 4,414,330., Cl. 435-93.000.
Fischell, Norman L. Apparatus and process for nesting drum bodies. 4,413,400., Cl. 29-515.000.
Fischer, Hanspeter: *See*—
Thummel, Rudolph C.; Fischer, Hanspeter; and Maier, Ludwig, 4,414,158., Cl. 260-438.100.
Fischer, Hermann, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Chain-type transport apparatus, for use with printing machines. 4,413,562., Cl. 101-408.000.
Fischer, Karl; and Schreder, Felix, to Fischer, Karl. Electric hotplate. 4,414,466., Cl. 219-459.000.
Fischer, Robert A. Anti-flashback cutting torch. 4,413,809., Cl. 266-48.000.
Fischer, Robert R.; and Urschel, Joe R., to Urschel Laboratories, Incorporated. Method of making a tubular cylinder for extruding a product. 4,413,537., Cl. 76-101.00R.

Fischer, Wilfried, to Brown, Boveri & Cie AG. Shunt element. 4,414,297., Cl. 429-61.000.

Fisher, Harry M.; and Fisher, Stuart N., to Talon, Inc. Slide fastener chain with leg remanents at gap and method and apparatus of manufacture. 4,413,398., Cl. 29-410.000.

Fisher, Robert P. Method for generating chlorine dioxide gas. 4,414,180., Cl. 422-186.000.

Fisher, Stuart N.: *See—*
Fisher, Harry M.; and Fisher, Stuart N., 4,413,398., Cl. 29-410.000.

Fishman, Avraham. Device for holding an object on a smooth shelf surface. 4,413,802., Cl. 248-362.000.

Fisons Limited: *See—*
Raphael, Richard A.; Eyley, Stephen C.; and Coltman, Stephen C. W., 4,414,416., Cl. 564-443.000.

Flambeau Product Corporation: *See—*
Lanius, Charles A.; Hulterstrum, Harold D.; and Rau, Gerald A., 4,413,804., Cl. 251-144.000.

Flanagan, Francis. Sliding patio for travel trailers and mobile homes. 4,413,855., Cl. 296-162.000.

Flat Auto S.p.A.: *See—*
Leoni, Aldo, 4,413,605., Cl. 123-547.000.

Fleig, Gunther: *See—*
Schaefer, Gerd; Ott, Winfried; and Fleig, Gunther, 4,413,788., Cl. 239-703.000.

Fleming, Mable L.: *See—*
Dwyer, R. William, Jr.; and Fleming, Mable L., 4,413,641., Cl. 131-361.000.

Flieter, Wilhelm: *See—*
Klie, Jurgen; Lubos, Walter; and Flieter, Wilhelm, 4,413,548., Cl. 91-491.000.

Flory, Robert E., to RCA Corporation. Clamp for line-alternate signals. 4,414,572., Cl. 358-172.000.

Floyd, Levon R.: *See—*
Avery, Randall N.; Clayton, Charles A.; Floyd, Levon R.; Mackintosh, Douglas B.; Powell, Willie A.; and Atkins, Michael W., 4,413,674., Cl. 165-104.330.

Flye, Donald R.; and Heininger, Richard T., to Gem Industries, Inc. Safety latch for crib drop side. 4,413,365., Cl. 5-100.000.

FMC Corporation: *See—*
Peterson, Shepard J., 4,413,690., Cl. 177-54.000.

Foley, James W. B., to General Electric Company. Low dissipation snubber for switching power transistors. 4,414,479., Cl. 307-253.000.

Folk, Stewart H., to Stewart Folk & Company, Incorporated. Mining of sulphur with foam barrier. 4,413,859., Cl. 299-4.000.

Fonstad, Clifton G.: *See—*
Tabatabaie-Alavi, Kamal; Choudhury, Abu N. M. M.; Gabriel, Nancy J. (Slater); and Fonstad, Clifton G., 4,414,076., Cl. 204-15.000.

Footer, Marvin P. Brassiere construction. 4,413,625., Cl. 128-425.000.

Ford, Edward J., Jr., to United States of America, Navy. Gas generator outlet having controlled temperature transition. 4,414,181., Cl. 422-240.000.

Ford, Joseph B., to ERCO Industries Limited. Chlorate cell system. 4,414,088., Cl. 204-237.000.

Ford Motor Company: *See—*
Archer, Emmit W.; and Gentle, Derek F., 4,414,266., Cl. 428-287.000.
Jackson, Alan S., 4,413,551., Cl. 98-40.00V.
Novak, Robert F., 4,414,531., Cl. 338-34.000.
Shah, Ramesh H., 4,413,840., Cl. 280-784.000.
Slocombe, Joseph; and Parry, Michael A., 4,413,694., Cl. 180-89.140.
Slocombe, Joseph; and Parry, Michael A., 4,413,695., Cl. 180-89.140.
Slocombe, Joseph; and Parry, Michael A., 4,413,696., Cl. 180-89.140.
Whitney, Douglas A.; and Kavalhuna, Sergio, 4,413,536., Cl. 74-869.000.

Forest Industries Machine Corp.: *See—*
Gregoire, James L.; Wismer, Robert D.; and Brouer, Robert L., 4,413,662., Cl. 144-356.000.

Forrest, John W.; and DeFusco, Thomas, to Bowmar/ALI, Inc. Adaptable connector for a fiber optic testing device. 4,413,880., Cl. 350-96.200.

Forrest, Stephen R.; Kohl, Paul A.; and Panock, Richard L., to Bell Telephone Laboratories, Incorporated. Electrochemical photoetching of compound semiconductors. 4,414,066., Cl. 204-129.300.

Foster, Ellis L.: *See—*
Wickersham, Charles E.; and Foster, Ellis L., 4,414,085., Cl. 204-192.00C.

Foster, Randy C., to Dayco Corporation. Belt tensioner, part therefor and methods of making the same. 4,413,982., Cl. 474-138.000.

Fotiu, Eustace; Tietjen, Marlene; Goldner, Tibor; and Rosenblum, Philip, to Revlon, Inc. Cosmetic pencil having a sharpenable polyethylene casing. 4,413,921., Cl. 401-96.000.

Franken, Klaus: *See—*
Schrewe, Hans; Parschat, Lothar; Franken, Klaus; and Geisbusch, Peter, 4,413,667., Cl. 164-154.000.

Frankle, Gerhard: *See—*
Klak, Roland; Frankle, Gerhard; and Woschee, Dieter, 4,413,606., Cl. 123-550.000.

Fredette, Maurice C. J.; and Cowley, Gerald, to ERCO Industries Limited. Production of chlorine dioxide on a small scale. 4,414,193., Cl. 423-478.000.

Freed, Meier E., to American Home Products Corporation. 4-Substituted-piperidino carboxamides. 4,414,389., Cl. 544-349.000.

Freed, William K.: *See—*
Hoffman, Ronald E.; and Freed, William K., 4,413,420., Cl. 33-180.0AT.

Frenkel, Alexander D.: *See—*
Copp, Frederick C.; Roberts, Peter T.; Frenkel, Alexander D.; and Collard, David, 4,414,223., Cl. 424-273.00R.

Friedheim, Max. Steam jet clearing and sterilizing system. 4,414,037., Cl. 134-35.000.

Friedrich, Maria S.; Suresh, Dev D.; and Grasselli, Robert K., to Standard Oil Co., The. Impregnating catalysts. 4,414,134., Cl. 502-204.000.

Frisbie, Donald; Frisbie, Larry D.; and Olson, Joel J. Article orientation device. 4,413,722.. Cl. 198-392.000.

Frisbie, Larry D.: *See—*
Frisbie, Donald; Frisbie, Larry D.; and Olson, Joel J., 4,413,722., Cl. 198-392.000.

Frisch, Kurt C.: *See—*
Klempner, Daniel; and Frisch, Kurt C., 4,414,174., Cl. 264-328.600.

Fromson, Howard A.: *See—*
Gracia, Robert F.; and Fromson, Howard A., 4,414,315., Cl. 430-302.000.

Frost, Robert T.: *See—*
Lowry, Hugh R.; and Frost, Robert T., 4,414,285., Cl. 428-577.000.

Frostig, Amos, to Etablissement Salgad. Fin-stabilized mortar grenade. 4,413,567., Cl. 102-525.000.

Fu, Cherng-Chyi, to Syntex (U.S.A.) Inc. Contact lens cleaning solutions. 4,414,127., Cl. 252-95.000.

Fuchs, Peter: *See—*
Willer, Walter; and Fuchs, Peter, 4,414,513., Cl. 330-204.000.

Fuderer, Andrija, to Union Carbide Corporation. Pocess for the production of ammonia. 4,414,191., Cl. 423-359.000.

Fuji Photo Film Co., Ltd.: *See—*
Kitamoto, Tatsuji; Shirahata, Ryuji; Yamada, Yasuyuki; and Akashi, Goro, 4,414,271., Cl. 428-328.000.
Masuda, Nobuhito, 4,414,323., Cl. 435-7.000.
Masuda, Nobuhito; Mihara, Yuji; Okazaki, Masaki; and Makiuchi, Hajime, 4,414,325., Cl. 435-7.000.
Miyoshi, Takahito; Okutu, Toshimitu; Akashi, Goro; Kitamoto, Tatsuji; and Fujiyama, Masaaki, 4,414,270., Cl. 428-325.000.
Nakamura, Koichi; and Hirai, Hiroyuki, 4,414,305., Cl. 430-373.000.
Wada, Minoru; Takahashi, Yonosuke; and Hasegawa, Eiichi, 4,414,273., Cl. 428-336.000.

Fuji Xerox Co., Ltd.: *See—*
Ogasawara, Satoru, 4,414,582., Cl. 358-282.000.

Fujii, Masanori: *See—*
Miyakawa, Nobuhiro; Fujii, Masanori; and Maekawa, Kouzi, 4,414,321., Cl. 430-106.600.
Miyakawa, Nobuhiro; Fujii, Masanori; and Maekawa, Kouzi, 4,414,322., Cl. 430-106.600.

Fujimoto, Masaharu: *See—*
Iwanami, Masaru; Maeda, Tetsuya; Nagano, Yoshinobu; Fujimoto, Masaharu; Nagano, Noriaki; Yamazaki, Atsuki; Tamazawa, Kazaharu; Murase, Kiyoshi; and Shibanuma, Tadao, 4,414,153., Cl. 260-239.100.

Fujimura, Takashi: *See—*
Nishizawa, Masahiko; and Fujimura, Takashi, 4,414,318., Cl. 430-24.000.

Fujisawa Pharmaceutical Co., Ltd.: *See—*
Ikushima, Koichi; Tanaka, Hirokazu; Osamu, Ohe; Kino, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; Arakawa, Akira; and Imanaka, Hiroshi, 4,414,226., Cl. 424-279.000.
Imanaka, Hiroshi; Miyoshi, Toshio; Konomi, Toshio; Kubochi, Yoshiaki; Hattori, Seiziro; and Kawakita, Takeshi, 4,414,328., Cl. 435-47.000.

Fujitsu Fanuc Ltd.: *See—*
Nomura, Yoshiyuki; and Okuda, Kanemasa, 4,414,457., Cl. 219-69.00W.

Fujitsu Limited: *See—*
Murakami, Keiichi; Amemiya, Shinichi; Miyazaki, Junji; Yanashima, Tadahiko; Iida, Atsuo; Shimura, Takaki; Miwa, Hirohide; and Midorikawa, Norio, 4,413,520., Cl. 73-609.000.
Nomura, Yoshiyuki, 4,414,458., Cl. 219-69.00W.
Tsuchimoto, Takamitsu; Kaneda, Saburo; Miyazawa, Tatsushi; Shimada, Toshio; Suzuki, Hideo; Sanagai, Mitsuru; and Hiraoka, Kaoru, 4,414,620., Cl. 364-200.000.

Fujiyama, Masaaki: *See—*
Miyoshi, Takahito; Okutu, Toshimitu; Akashi, Goro; Kitamoto, Tatsuji; and Fujiyama, Masaaki, 4,414,270., Cl. 428-325.000.

Fukai, Kiyoshi: *See—*
Matsumoto, Seiji; Koga, Tadashi; Fukai, Kiyoshi; and Yamamoto, Hideji, 4,414,196., Cl. 423-633.000.

Fukuda, Tadaji: *See—*
Shirai, Shigeru; Kanbe, Junichiro; and Fukuda, Tadaji, 4,414,319., Cl. 430-65.000.

Fukuda, Takemi: *See—*
Kawakita, Takeshi; Chihara, Yasuaki; Fukuda, Takemi; Setoguchi, Michihide; and Tahara, Tetsuya, 4,414,216., Cl. 424-251.000.

Fukui, Kouetsu: *See—*
Kigawa, Tomio; and Fukui, Kouetsu, 4,413,929., Cl. 405-260.000.

Fukuoka, Takashi: *See—*
Inaga, Hisashi; and Fukuoka, Takashi, 4,413,705., Cl. 181-240.000.

Fukushima, Tsutomu; Kawasaki, Kiyoshi; and Sasaki, Sadayuki, to Nippon Kokan Kabushiki Kaisha. Method for the production of ferrochromium. 4,414,026., Cl. 75-130.500.

Fulford, Garry: *See*—
Newsome, Thomas B.; and Fulford, Garry, 4,413,716., Cl. 192-70.120.

Fumitsu Limited: *See*—
Yanase, Takeyasu, 4,414,648., Cl. 365-16.000.

Furihata, Hiroyuki, to Olympus Optical Co., Ltd. Endoscope with adapter. 4,414,608., Cl. 362-32.000.

G. A. Serlachius Oy: *See*—
Larikka, Leo, 4,413,485., Cl. 72-71.000.

G. Dusterloh GmbH: *See*—
Klie, Jurgen; Lubos, Walter; and Flieter, Wilhelm, 4,413,548., Cl. 91-491.000.

G. Rau GmbH & Co.: *See*—
Schneider, Friedrich, 4,414,444., Cl. 219-121.0LM.

Gabriel, Fredy, to Stapro AG. Device for fastening elongated synthetic resin profiles. 4,413,799., Cl. 248-59.000.

Gabriel, Nancy J. (Slater): *See*—
Tabatabaie-Alavi, Kamal; Choudhury, Abu N. M. M.; Gabriel, Nancy J. (Slater); and Fonstad, Clifton G., 4,414,076., Cl. 204-15.000.

Gale, Edward A.; Wetzel, John J., III; and Wetzel, James H. Laser-sighted briefcase firing device. 4,414,610., Cl. 362-113.000.

Galena, Peter E.: *See*—
Hackett, Walter J.; and Galena, Peter E., 4,414.360., Cl. 524-560.000.

Galera, Richard: *See*—
Cornu, Jean; Detriche, Jean-Marie; Tiret, Bernard; Jorge, Gerard; Galera, Richard; Biava, Dominique; and Marchal, Paul. 4,413,910., Cl. 356-377.000.

Galindo, Rudolph D., to Petillo, Bruce; and Pawlowski, Stan. Track lighting system. 4,414,617., Cl. 362-404.000.

Gallagher, Timothy J.; and Ju, Kochan, to International Business Machines Corporation. Gap tolerant merge element for contiguous-disk bubble devices. 4,414,649., Cl. 365-36.000.

Galloway, James H.: *See*—
Kiwalle, Jozef; Galloway, James H.; and Rowan, John W., 4,414,292., Cl. 429-19.000.

Galvin, Ralph B. Sun tracking device. 4,413,423., Cl. 33-268.000.

Gandolfi, Carmelo: *See*—
Pellegata, Renato; and Gandolfi, Carmelo, 4,414,407., Cl. 424-305.000.

Gano, Lloyd D. Cooling system protective device. 4,413,675., Cl. 165-119.000.

Garcia, Earl R.: *See*—
Lu, Wen-Tong P.; and Garcia, Earl R., 4,414,092., Cl. 204-294.000.

Gardner, Anthony R. Method of playing a board game utilizing cards. 4,413,828., Cl. 273-236.000.

Gardner, Hugh C., to Union Carbide Corporation. Curable molding compositions. 4,414,367., Cl. 525-531.000.

Garnier, Andre, to Vallourec SA. Method for fixing a tube by expansion. 4,413,395., Cl. 29-157.30C.

Garrabrants, Ralph S. Switch with replaceable flasher unit. 4,414,525., Cl. 337-92.000.

Garrett Corporation, The: *See*—
Ryan, William F., 4,413,795., Cl. 244-3.220.
Schug, Arden L., 4,414,631., Cl. 364-426.000.

Garth, Geoffrey C. Portable cervical collar. 4,413,619., Cl. 128-76.00R.

Garwood, William E.: *See*—
Chester, Arthur W.; and Garwood, William E., 4,414,097., Cl. 208-59.000.

Garzon, Ruben D., to Brown Boveri Electric, Inc. Liquid SF_6 interrupter with proportional feedback. 4,414,445., Cl. 200-148.00A.

Garzon, Ruben D., to Brown Boveri Electric Inc. Quick open and close disconnect switch. 4,414,449., Cl. 200-146.00R.

Gast, Uwe; Jung, Eggert; Kuhn, Franz; Mollgaard, Klaus; Redecker, Friedrich; Sendtko, Ulrich; Sommer, Rudiger; Wellendorf, Klaus; and Knop, Hans-Georg, to Dr.-Ing. Rudolf Hell GmbH. Method and circuit for recognition of colors. 4,414,635., Cl. 364-526.000.

Gates Energy Products, Inc.: *See*—
Uba, Toshio, 4,414,295., Cl. 429-59.000.

Gaul, James M.; and Nguyen, Tinh, to Atlantic Richfield Company. Organic polyisocyanate-cyclic alkylene carbonate adhesive binder compositions. 4,414,361., Cl. 524-702.000.

Gavagan, James A.; and Brennan, William E., to Irvin Industries, Inc. Inverse clevis safety belt buckle. 4,413,385., Cl. 24-230.00A.

Gazard, Maryse: *See*—
Eranian, Armand; Dubois, Jean-Claude; Gazard, Maryse; and Barre, Francoise, 4,414,081., Cl. 204-159.180.

Gazzarrini, Vinicio, to Solis S.r.l. Device for trimming an edge of a tubular textile article. 4,413,575., Cl. 112-129.000.

Gedeon, Carl A.: *See*—
Louis, Timothy R.; Gedeon, Carl A.; Lee, Maw H.; and Erjavec, Eugene V., 4,414,634., Cl. 364-510.000.

Geel, Zane H.; Hornby, Roger B.; Lipps, Bennie J.; Savage, Charles E.; and Vanat, Pierre, to Cordis Dow Corp. Sealing for a hollow fiber separatory device. 4,414,110., Cl. 210-321.300.

Gehrmann, Klaus: *See*—
Erpenbach, Heinz; Gehrmann, Klaus; Lork, Winfried; and Prinz, Peter, 4,414,160., Cl. 260-544.00A.

Gehrt, Louis M., to Emerson Electric Co. Environmentally protected switch construction. 4,414,443., Cl. 200-80.00R.

Geisbusch, Peter: *See*—
Schrewe, Hans; Parschat, Lothar; Franken, Klaus; and Geisbusch, Peter, 4,413,667., Cl. 164-154.000.

Geisey, James W., to Rotek Incorporated. Bearing assembly with wear pads. 4,413,866., Cl. 308-217.000.

Gelez, Jean-Philippe, to Societe Anonyme dite Alsthom-Atlantique. Electric arc cooling apparatus for the chimneys of cut-out devices. 4,414,446., Cl. 200-144.00R.

Gem Industries, Inc.: *See*—
Flye, Donald R.; and Heininger, Richard T., 4,413,365., Cl. 5-100.000.

Genentech, Inc.: *See*—
Goeddel, David V., 4,414,150., Cl. 260-112.50R.

General American Transportation Corporation: *See*—
Price, Albert E., 4,414,462., Cl. 219-202.000.

General Electric Company: *See*—
Bedard, James F.; Eichelberger, Charles W.; and Nati, Salvatore F., Jr., 4,414,501., Cl. 323-280.000.
Bennett, Moreland P.; and Ballard, Donald E., 4,413,406., Cl. 29-609.000.
Cline, Harvey E., 4,414,243., Cl. 427-100.000.
Cohen, Stuart C.; Kostelnik, Robert J.; and Wambach, Allen D., 4,414,352., Cl. 524-443.000.
Dean, Gilbert J.; and White, Loren H., 4,413,477., Cl. 60-757.000.
Dickenson, Royston J., 4,414,540., Cl. 340-508.000.
Foley, James W. B., 4,414,479., Cl. 307-253.000.
Heckelman, Richard W.; Marchant, Christopher E.; and Williams, Jack B., 4,414,669., Cl. 371-49.000.
Hoffman, David M.; Pritzkow, Dennis; and Lang, George R., 4,414,473., Cl. 250-366.000.
Lowry, Hugh R.; and Frost, Robert T., 4,414,285., Cl. 428-577.000.
Milkovic, Miran, 4,414,510., Cl. 324-252.000.
Sidebottom, Donald L., 4,413,672., Cl. 165-22.000.
Smith, Murray S., Jr.; Hilboldt, Mark S.; and Mathur, Pracheeshwar S., 4,414,178., Cl. 422-444.000.
Vaughn, Howard A., Jr.; and Ching, Ta-Yen, 4,414,349., Cl. 524-261.000.
Webster, Harold F., 4,413,766., Cl. 228-123.000.

General Foods Corporation: *See*—
Evans, David N.; Jarvis, Gary W.; Steensen, Wayne L.; and Shah, Manoj Kumar O., 4,414,237., Cl. 426-589.000.

General Foods Limited: *See*—
Oven, Judith L., 4,414,239., Cl. 426-607.000.

General Instrument Corporation: *See*—
Knapp, William; Dunn, William; and Smith, Kent F., 4,414,547., Cl. 340-825.830.

General Motors Corporation: *See*—
Fales, Douglas I., 4,413,953., Cl. 417-262.000.
McMahan, David R.; Zeller, Gary P.; Slaughter, Ronald W.; Skirha, Martin D.; and Bayer, Dean M., 4,413,856., Cl. 296-188.000.
McMahan, David R.; and Nicholas, Richard W., 4,414,614., Cl. 362-269.000.
Varterasian, John H.; Plack, Albert R.; and Melichar, Jackson W., 4,413,838., Cl. 280-751.000.

General Products Company, Inc.: *See*—
McKann, H. Smith, 4,413,397., Cl. 29-416.000.

General Tire & Rubber Company, The: *See*—
Cobbledick, David S.; Reichenbach, Donald F.; and Shanoski, Henry, 4,414,173., Cl. 264-257.000.
Lenke, Gerd M.; and Fabris, Hubert J., 4,414,362., Cl. 525-178.000.

Genrad, Inc.: *See*—
Greenwood, Edward H., 4,414,664., Cl. 371-20.000.

Gentle, Derek F.: *See*—
Archer, Emmit W.; and Gentle, Derek F., 4,414,266., Cl. 428-287.000.

Georg Fischer Brugg-Oehler AG: *See*—
Bernath, Oskar, 4,414,050., Cl. 156-166.000.

George P. Reintjes Company, Inc.: *See*—
Musser, John J., 4,413,572., Cl. 110-331.000.

Gerlach, Horst. Method of assembling a spiral stair case. 4,413,460., Cl. 52-741.000.

Gerzon, Michael A., to National Research Development Corporation. Decoders for feeding irregular loudspeaker arrays. 4,414,430., Cl. 381-22.000.

Gessner, Gerald A., to Advanced Semiconductor Materials Die Bonding, Inc. Stepping motor drive circuit. 4,414,498., Cl. 318-696.000.

GHA Lock Joint, Inc.: *See*—
Swanson, Harold V., 4,414,385., Cl. 524-494.000.

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Wallace, William K.; Giardino, David A.; and Groshans, Joseph R., 4,413,396., Cl. 29-407.000.

Gibeau, Frank C.: *See*—
Farmer, Paul L.; Gibeau, Frank C.; Brown, Stanley F.; and Ploncak, Garold W., 4,414,594., Cl. 360-106.000.

Gilad, Aviram: *See*—
Gilead, Gideon; and Gilad, Aviram, 4,413,787., Cl. 239-542.000.

Gilb, Tyrell T., to Simpson Strong-Tie Company, Inc. Mud-sill anchor. 4,413,456., Cl. 52-295.000.

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Lucas, Jean; Molle, Jean-Francois; Gille, Etienne; and Creze, Patrick, 4,414,002., Cl. 48-209.000.

Gillespie, Ronald G., to Texaco Development Corporation. Alarm means for use with apparatus protecting a device situated in a borehole. 4,413,678., Cl. 166-57.000.

Gillette Company, The: *See*—
Trotta, Robert A., 4,413,411., Cl. 30-85.000.

Gilligan, William H.: *See*—
Sitzmann, Michael E.; and Gilligan, William H., 4,414,413., Cl. 564-35.000.

Gilvar, Martin; and Wykes, Philips, to Morgan Construction Company. Pinch roll system for vertical laying heads. 4,413,494., Cl. 72-167.000.

Ginsburg, Stephen J.; and Draheim, Frederick E., to Black Knight Investments Limited. Preform for molding custom dental impression trays. 4,413,979., Cl. 433-41.000.

Giolito, Silvio L., to Stauffer Chemical Company. Process for producing low temperature stable tert-butylphenyl diphenyl phosphate. 4,414,161., Cl. 260-975.000.

Giordano, Claudio; Belli, Aldo; Uggeri, Fulvio; and Villa, Giovanni, to Blaschim S.p.A. Process for preparing esters of 2-(6'methoxy-2'naphtyl)-propionic acid via rearrangement of new ketals of 2-halo-1-(6'-methoxy-2'-naphtyl)-propan-1-one and new esters of 2-(5'-bromo-6'-methoxy-2'-naphtyl)-propionic acid thus prepared. 4,414,405., Cl. 560-56.000.

GKN Transmissions Limited: *See*—
Palmer, Bertram J., 4,414,046., Cl. 156-73.500.

Glaser, Herbert: *See*—
Palm, Jurgen; Glaser, Herbert; Collin, Gerd; and Marrett, Rolf, 4,414,192., Cl. 423-445.000.

Glaser, Robert L., to Single Vend, Inc. Newspaper dispensing apparatus and method. 4,413,749., Cl. 221-1.000.

Glasurit America, Inc.: *See*—
Wright, Howard J.; Leonard, David P.; and Etzell, Roger A., 4,414,357., Cl. 524-513.000.

Gleitsmann, Gunter: *See*—
Ellendt, Gunther; Gleitsmann, Gunter; and Scheidel, Max, 4,414,074., Cl. 203-21.000.

Gloth, Richard E.; Tazuma, James J.; and Keck, Max H., to Goodyear Tire & Rubber Company, The. Stabilized polyester compositions. 4,414,348., Cl. 524-255.000.

Goans, Kip B., to Baker Cac, Inc. Diaphragm valve and method. 4,413,651., Cl. 137-625.250.

Godbey, John K., to Mobil Oil Corporation. System for measuring cuttings and mud carryover during the drilling of a subterranean well. 4,413,511., Cl. 73-155.000.

Goeddel, David V., to Genentech, Inc. Hybrid human leukocyte interferons. 4,414,150., Cl. 260-112.50R.

Goettler, Lloyd A.: *See*—
Coran, Aubert Y.; and Goettler, Lloyd A., 4,414,267., Cl. 428-288.000.

Goff, David L.; Yuan, Edward L.; and Proskow, Stephen, to Du Pont de Nemours, E. I., and Company. Photopolymerizable polyamide ester resin compositions containing an oxygen scavenger. 4,414,312., Cl. 430-283.000.

Goffinet, Pierre C. E., to Procter & Gamble Company, The. Liquid detergent compositions. 4,414,128., Cl. 252-111.000.

Goldberg, Jack M. Diagnostic agents. 4,414,326., Cl. 435-11.000.

Goldner, Tibor: *See*—
Fotiu, Eustace; Tietjen, Marlene; Goldner, Tibor; and Rosenblum, Philip, 4,413,921., Cl. 401-96.000.

Goncharenko, Vladimir V.: *See*—
Paton, Boris E.; Latash, Jury V.; Zabarilo, Oleg S.; Melnik, Gary A.; Zamulo, Nikolai I.; Zhdanovsky, Anatoly A.; Bukalo, Alfred I.; Goncharenko, Vladimir V.; Ivanchenko, Stanislav S.; Slobodian, Anatoly R.; Bakumenko, Sergei P.; and Zakamarkin, Mikhail K., 4,414,672., Cl. 373-22.000.

Goodall, Brian L.; van der Nat, Adrianus A.; and Sjardijn, Willem, to Shell Oil Company. Olefin polymerization catalyst compositions and a process for the polymerization of olefins employing such compositions. 4,414,132., Cl. 502-169.000.

Goodyear Tire & Rubber Company, The: *See*—
Cottman, Kirkwood S., 4,414,408., Cl. 560-144.000.
Gloth, Richard E.; Tazuma, James J.; and Keck, Max H., 4,414,348., Cl. 524-255.000.
Hoffman, Ronald E.; and Freed, William K., 4,413,420., Cl. 33-180.0AT.

Goose, John: *See*—
Brooker, Peter J.; and Goose, John, 4,414,222., Cl. 424-270.000.

Gordon, Jack D.: *See*—
Tenold, Tyrus N.; Cossette, Michael D.; Kuntz, James P.; and Gordon, Jack D., 4,413,747., Cl. 220-225.000.

Gordon, Maxwell; and Christie, George J., to Bristol-Myers Company. Animal feeds. 4,414,206., Cl. 424-177.000.

Gorgerino, Mario; and Videau, Daniel, to Companie Universelle d'Acetylene et d'Electrometallurgie. Method for obtaining iron-based alloys allowing in particular their mechanical properties to be improved by the use of lanthanum, and iron-based alloys obtained by the said method. 4,414,027., Cl. 420-578.000.

Gorkiewicz, Mitchell F. Retractable receptacle support mechanism. 4,413,868., Cl. 312-211.000.

Gormel, Thomas M.: *See*—
Kapecki, Jon A.; Gormel, Thomas M.; and Vincent, Sheridan E., 4,414,307., Cl. 430-465.000.

Gould, George K.; and Steinberg, Eric, to Video Corporation of America. Vending ordering terminal. 4,414,467., Cl. 235-381.000.

Gould Inc.: *See*—
Panaro, Robert J., 4,414,526., Cl. 337-163.000.

Gozzo, Franco: *See*—
Colle, Roberto; Gozzo, Franco; and Preziuso, Ciro, 4,414,018., Cl. 71-88.000.

Gracia, Robert F.; and Fromson, Howard A., to Fromson, Howard A. Lithographic printing plate and process. 4,414,315., Cl. 430-302.000.

Graff, Roderich W. Method and apparatus for drying moist exhaust air from one or more bulk material drying hoppers. 4,413,426., Cl. 34-27.000.

Graham, Robert M.: *See*—
Dunn, J. James; and Graham, Robert M., 4,413,733., Cl. 206-446.000.

Grakauskas, Vytautas: *See*—
Berkowitz, Phillip T.; Baum, Kurt; and Grakauskas, Vytautas, 4,414,384., Cl. 528-417.000.

Grandes Boulangeries Associees G.B.A.: *See*—
Nourigeon, Andre, 4,414,228., Cl. 426-19.000.

Grant, Willie T. Direct drive air register damper. 4,413,774., Cl. 236-9.00A.

Grasselli, Robert K.: *See*—
Friedrich, Maria S.; Suresh, Dev D.; and Grasselli, Robert K., 4,414,134., Cl. 502-204.000.

Gratz, Eugene J.: *See*—
Duffy, Brian J.; Gratz, Eugene J.; Potter, Steven E.; and Power, Royal A., 4,414,171., Cl. 264-249.000.

Grau, Werner: *See*—
Kneller, Eckhart; Koenig, Roland; Koester, Eberhard; Grau, Werner; and Mayer, Dieter, 4,414,287., Cl. 428-650.000.

Graviner Limited: *See*—
Farquhar, Robert L.; and Ball, David N., 4,414,542., Cl. 340-578.000.

Gray, Billy D.: *See*—
Anderson, Edward A.; Bennett, Benjamin; and Gray, Billy D., 4,414,606., Cl. 361-397.000.

Great Lakes Carbon Corporation: *See*—
Prescott, Roger, 4,413,860., Cl. 301-63.0PW.

Greater Glasgow Health Board: *See*—
Paton, John S., 4,413,760., Cl. 222-309.000.

Green Cross Corporation, The: *See*—
Watanabe, Ryozo; Kawasumi, Keiichi; Maeda, Shoichi; and Shoji, Takashi, 4,414,336., Cl. 436-502.000.

Green, Robert H.; and Simon, James D. Valve detent. 4,413,805., Cl. 251-297.000.

Greenwood, Edward H., to Genrad, Inc. Wait circuitry for interfacing between field maintenance processor and device specific adaptor circuit. 4,414,664., Cl. 371-20.000.

Gregoire, James L.; Wismer, Robert D.; and Brouer, Robert L., to Forest Industries Machine Corp. Edging system. 4,413,662., Cl. 144-356.000.

Gregor Jonsson Associates, Inc.: *See*—
Betts, Edmund D., 4,413,377., Cl. 17-73.000.

Grell, Wolfgang: *See*—
Sauter, Robert; Griss, Gerhart; Grell, Wolfgang; Hurnaus, Rudolf; Eisele, Bernhard; Haarmann, Walter; and Rupprecht, Eckhard, 4,414,225., Cl. 424-274.000.

Gremelspacher, Cornelius J.: *See*—
Gremelspacher, Philip E.; and Gremelspacher, Cornelius J., 4,413,685., Cl. 172-316.000.

Gremelspacher, Philip E.; and Gremelspacher, Cornelius J. Planter implement with adjusting position-display apparatus and system thereof. 4,413,685., Cl. 172-316.000.

Griesshaber, Karl H.; and Bialo, Charles A., to Ampex Corporation. Pattern recogniiion circuit for reliably distinguishing between different portions of a diascope pattern during video camera setup. 4,414,573., Cl. 358-163.000.

Griffin, Brian P.; and MacDonald, William A., to Imperial Chemical Industries PLC. Thermotropic polyester anhydride polymers. 4,414,381., Cl. 528-190.000.

Griffin, Peter J. Motion conversion device and rotary displacement device. 4,413,961., Cl. 418-38.000.

Griffith, Jon K.: *See*—
Anderson, Wilbur F.; and Griffith, Jon K., 4,413,418., Cl. 33-174.00L.

Grimes, Gary J., to Bell Telephone Laboratories, Incorporated. Digital data entry glove interface device. 4,414,537., Cl. 340-365.00R.

Griss, Gerhart: *See*—
Sauter, Robert; Griss, Gerhart; Grell, Wolfgang; Hurnaus, Rudolf; Eisele, Bernhard; Haarmann, Walter; and Rupprecht, Eckhard, 4,414,225., Cl. 424-274.000.

Gros, Pierre: *See*—
Jansen, Franz K.; and Gros, Pierre, 4,414,148., Cl. 260-112.00B.

Groshans, Joseph R.: *See*—
Wallace, William K.; Giardino, David A.; and Groshans, Joseph R., 4,413,396., Cl. 29-407.000.

Gross, Heinz; Reith, Friedrich; Retzlaff, Friedhelm; and Schlusnus, Karl H., to Hoesch Werke Aktiengesellschaft. Method of making high strength steel tube. 4,414,042., Cl. 148-12.00R.

Grossiord, Claude R.: *See*—
Guadagnin, Laurent J.; and Grossiord, Claude R., 4,413,530., Cl. 73-861.470.

Grove Valve and Regulator Company: *See*—
Van Scoy, Davis A., 4,413,532., Cl. 73-861.610.

Grube, Gerald W., to Bell Telephone Laboratories, Incorporated. Apparatus for generating the inverse of binary numbers. 4,414,642., Cl. 364-766.000.

Gruen, Dieter M.: *See*—
Krauss, Alan R.; and Gruen, Dieter M., 4,414,176., Cl. 376-136.000.

Grumer, Peter; Wiese, Wolfgang; and Serrin, Gunter, to Hauni-Werke Korber & Co. KG. Method for applying liquid plasticizer to filamentary filter material. 4,414,253., Cl. 427-424.000.

GTE Products Corporation: *See*—
Bennett, James F., 4,414,667., Cl. 371-37.000.

de Vos, Hendrik A. J.; and Labouliere, Elzear R., 4,414,616., Cl. 362-308.000.

Guadagnin, Laurent J.; and Grossiord, Claude R., to Cricket Sarl. Device for measuring and monitoring gas flowrates. 4,413,530., Cl. 73-861.470.

Guier, William. Drilling apparatus. 4,413,387., Cl. 188-67.000.

Gulf Oil Corporation: *See—*
Karim, Khalid A.; and Rea, James H., 4,414,053., Cl. 156-308.200.

Gunesin, Binnur; and Halasa, Adel E., to Firestone Tire & Rubber Company, The. Butadiene-styrene-N,N-dialkylacrylamine terpolymers. 4,414,374., Cl. 526-217.000.

Gunesin, Binnur: *See—*
Dougherty, David J.; Gunesin, Binnur; and Spiewak, John W., 4,414,359., Cl. 524-555.000.

Guth, Christian; and Binz, Jorg, to Ciba-Geigy Corporation. Process for the treatment of textile fibre materials. 4,413,998., Cl. 8-477.000.

Guthrie, Robin J. Electrically insulating and sealing frame. 4,414,294., Cl. 429-35.000.

Gutman, Arnold D., to Stauffer Chemical Company. 2-Benzyl 1,3-dithiolanes as herbicidal antidotes. 4,414,019., Cl. 71-91.000.

Gutsche, Guenter E. Elements for a tool system. 4,413,937., Cl. 408-239.00A.

Guttman, Yolan R. Infiltration-proof intravenous needle. 4,413,993., Cl. 604-274.000.

H. A. Schlatter AG: *See—*
Zollinger, Hans R., 4,414,454., Cl. 219-53.000.

Haarman, Johan W.: *See—*
Liebert, Richard B.; and Haarman, Johan W., 4,414,679., Cl. 378-29.000.

Haarmann, Walter: *See—*
Sauter, Robert; Griss, Gerhart; Grell, Wolfgang; Hurnaus, Rudolf; Eisele, Bernhard; Haarmann, Walter; and Rupprecht, Eckhard, 4,414,225., Cl. 424-274.000.

Habata, Etsuroh; Ohshima, Nobumasa; and Kanatani, Kenji, to Matsushita Electric Industrial Co., Ltd. Positive-temperature-coefficient thermistor heating device. 4,414,052., Cl. 156-273.700.

Habicht, Ernst; and Zbinden, Paul, to Ciba-Geigy Corporation. Benzodioxole derivatives and pharmaceutical use thereof. 4,414,214., Cl. 424-248.510.

Hackbarth, Eugene R., to Outboard Marine Corporation. Marine propulsion device including bearing head retention means. 4,413,865., Cl. 308-207.00R.

Hackett, Walter J.; and Galena, Peter E., to Purex Corporation. Spray buff reactant and application thereof. 4,414,360., Cl. 524-560.000.

Haga, Tsutomu: *See—*
Sashida, Iwao; and Haga, Tsutomu, 4,414,436., Cl. 179-110.00A.

Hagino, Isamu: *See—*
Hattori, Kyo; Shibata, Noriyoshi; and Hagino, Isamu, 4,413,471., Cl. 60-276.000.

Haidinger, Erich, to Siemens Aktiengesellschaft. Method for attaching and fastening parallel current lead wires to opposite lateral surfaces of electrical components. 4,413,409., Cl. 29-856.000.

Haigh, Paul, to Knoll International, Inc. Table easily assembled from standardized parts and corner clamping assembly usable therewith. 4,413,570., Cl. 108-153.000.

Halasa, Adel E.: *See—*
Gunesin, Binnur; and Halasa, Adel E., 4,414,374., Cl. 526-217.000.

Halgas, George M.: *See—*
Ichikawa, Yoshio; and Halgas, George M., 4,414,337., Cl. 501-103.000.

Hall, Henry K., Jr.: *See—*
Conciatori, Anthony B.; Choe, Eui W.; and Hall, Henry K., Jr., 4,414,383., Cl. 528-336.000.

Hall, Robert N.; Carlson, Franklin B.; and Thomson, William J., to Tosco Corporation. Process for combusting carbonaceous solids containing nitrogen. 4,413,573., Cl. 110-347.000.

Hall, Wilbur S., to Amchem Products, Inc. Ferrous complexing agent for autodeposition. 4,414,350., Cl. 524-320.000.

Halliburton Company: *See—*
Carter, Ernest E., Jr., 4,413,653., Cl. 138-89.000.
Murphey, Joseph R., 4,414,118., Cl. 252-8.55C.

Halm Instrument Co., Inc.: *See—*
Lyon, Floyd A.; Yale, William H.; and Lyon, Donald, 4,413,614., Cl. 126-421.000.

Hamada, Fumio, to Konishiroku Photo Industry Co., Ltd. Silver halide color photographic photosensitive material. 4,414,308., Cl. 430-505.000.

Hamada, Toshio; and Ohtomo, Fumio, to Tokyo Kogaku Kikai Kabushiki Kaisha. Electro-optical range finder using three modulation frequencies. 4,413,904., Cl. 356-5.000.

Hamel, Pierre: *See—*
Aubouy, Michel; Hamel, Pierre; and Molin, Marc, 4,414,415., Cl. 564-412.000.

Hamielec, Archie E.; Lawless, Grant P.; and Schultz, Harold H., to S. C. Johnson & Son, Inc. Process for continuous bulk copolymerization of vinyl monomers. 4,414,370., Cl. 526-88.000.

Hamilton, Richard G.: *See—*
Schlessinger, Joseph E.; and Hamilton, Richard G., 4,413,632., Cl. 128-716.000.

Hammond, Anthony G.: *See—*
Walters, Ronald B.; and Hammond, Anthony G., 4,413,648., Cl. 137-486.000.

Hammond, Peter M.; Price, Christopher P; Scawen, Michael D.; and Atkinson, Anthony, to Public Health Laboratory Service Board. Method for the estimation of N-acylated primary aromatic amines. 4,414,327., Cl. 435-18.000.

Hanabata, Makoto; Maruyama, Takashi; and Ueno, Katsuji, to Sumitomo Chemical Company, Limited. Plastic container improved in barrier properties against gases and water vapor. 4,414,230., Cl. 426-106.000.

Hanabata, Makoto: *See—*
Sugimoto, Hiroaki; and Hanabata, Makoto, 4,414,365., Cl. 525-437.000.

Hanawa, Fumiaki: *See—*
Suto, Shoichi; Suda, Hiroyuki; Hanawa, Fumiaki; Nakahara, Motohiro; and Inagaki, Nobuo, 4,414,012., Cl. 65-18.200.

Handt, Alan E.; and Ash, Stephen R. Short-tubing set gravity powered peritoneal cycler. 4,413,988., Cl. 604-29.000.

Hankin, Thomas E., to ESB Incorporated. Process for manufacturing a porous dip tube. 4,414,168., Cl. 264-49.000.

Hanlet, Jacques M., to Intent Patent A.G. Electronic ballast system. 4,414,492., Cl. 315-290.000.

Hantelmann, Harald, to Escher Wyss Limited. Method of heat extraction from an aqueous carrier medium. 4,413,669., Cl. 165-1.000.

Haraga, Kousuke; and Hattori, Katsutoshi, to Mitsubishi Denki Kabushiki Kaisha; and Denki Kagaku Kogyo Kabushiki Kaisha. Elevator panel. 4,414,257., Cl. 428-182.000.

Harco Corporation: *See—*
Waits, Charles G.; Nicholas, Karl W.; and Bushman, James B., 4,414,511., Cl. 324-347.000.

Hardinge Brothers, Inc.: *See—*
Peris, John M., 4,413,939., Cl. 414-17.000.

Hareng, Michel; Huignard, Jean-Pierre; and Le Berre, Serge, to Thomson-CSF. Electro-optical display device. 4,413,885., Cl. 350-342.000.

Harlos, Hartmut S.: *See—*
Juhnke, Klaus; and Harlos, Hartmut S., 4,414,563., Cl. 358-21.00R.

Harmison, Herbert A., Jr., to Iowa State University Research Foundation, Inc. Electrical appliance lock. 4,413,488., Cl. 70-57.000.

Harper, Michael C.: *See—*
Sethofer, Nicholas L.; and Harper, Michael C., 4,414,131., Cl. 252-299.100.

Harricana Metal Inc.: *See—*
Marchildon, Jacques, 4,413,661., Cl. 144-2.00Z.

Harris, Alan L.; and White, Alfred K., to Lucas Industries Limited. Anti-skid vehicle braking systems. 4,414,630., Cl. 364-426.000.

Harris, Lewis K.: *See—*
Claxton, Kenneth W.; and Harris, Lewis K., 4,413,523., Cl. 73-701.000.

Harris, Norman; Dennis, Alan J.; and Harrison, George E., to Davy McKee (Oil & Chemicals) Limited. Aldehyde-ethers. 4,414,420., Cl. 568-454.000.

Harris, Robert F.: *See—*
Solc, Jitka; and Harris, Robert F., 4,414,339., Cl. 523-137.000.

Harrison, George E.: *See—*
Harris, Norman; Dennis, Alan J.; and Harrison, George E., 4,414,420., Cl. 568-454.000.

Harrison, Jonas P., to Chevron Research Company. Process for calcium fluoride production from industrial waste waters. 4,414,185., Cl. 423-163.000.

Hartman, George D., to Merck & Co., Inc. N-Acyl derivatives of 6-alkylamino 5-chloro-3-nitropyrazinamines for radiation therapy. 4,414,215., Cl. 424-250.000.

Hartmann, Albert: *See—*
Tarcsay, Lajos; Baschang, Gerhard; Hartmann, Albert; and Stanek, Jaroslav, 4,414,204., Cl. 424-177.000.

Hartmann, Ludwig; and Ambros, Otto, to Carl Freudenberg, Firma. Shaped body of a settable mineral material with reinforcement fibers embedded therein. 4,414,262., Cl. 428-222.000.

Harvey, Edgar L., to Burroughs Corporation. Display panel. 4,414,490., Cl. 315-169.400.

Hasegawa, Eiichi: *See—*
Wada, Minoru; Takahashi, Yonosuke; and Hasegawa, Eiichi, 4,414,273., Cl. 428-336.000.

Hashimoto, Masami, to Kabushiki Kaisha Suwa Seikosha. Low voltage regulation circuit. 4,414,503., Cl. 323-315.000.

Hatano, Masakatsu: *See—*
Otake, Masayuki; Hatano, Masakatsu; Koyama, Toru; Murayama, Masayoshi; and Oshima, Kazunori, 4,414,133., Cl. 502-179.000.

Hatazawa, Kikuo: *See—*
Ohno, Mitsuo; and Hatazawa, Kikuo, 4,414,556., Cl. 346-160.000.

Hathaway, Richard A., to Ampex Corporation. Fluid bearing tape scanning drum. 4,414,588., Cl. 360-84.000.

Hattori, Katsutoshi: *See—*
Haraga, Kousuke; and Hattori, Katsutoshi, 4,414,257., Cl. 428-182.000.

Hattori, Kyo; Shibata, Noriyoshi; and Hagino, Isamu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Air-fuel ratio control apparatus of an internal combustion engine. 4,413,471., Cl. 60-276.000.

Hattori, Seiziro: *See—*
Imanaka, Hiroshi; Miyoshi, Toshio; Konomi, Toshio; Kubochi, Yoshiaki; Hattori, Seiziro; and Kawakita, Takeshi, 4,414,328., Cl. 435-47.000.

Hattori, Yutaka: *See—*
Ohta, Minoru; Hattori, Yutaka; Kawakami, Tomio; and Onoda, Michitoshi, 4,413,502., Cl. 73-23.000.

Hauni-Werke Korber & Co. KG: *See—*
Grumer, Peter; Wiese, Wolfgang; and Serrin, Gunter, 4,414,253., Cl. 427-424.000.
Wahle, Gunter; and Rudszinat, Willy, 4,413,640., Cl. 131-281.000.

Hayashi, Kazuo, to Nissan Motor Co., Ltd. Seat cover. 4,413,857., Cl. 297-180.000.

Hayashi, Masaru: *See—*
Endo, Hiroshi; Awa, Masashi; Iiri, Shigeo; Oguchi, Toshihiko; Suzuki, Isao; Hirate, Naoyuki; and Hayashi, Masaru, 4,414,124., Cl. 252-62.630.

Hayashi, Michitaka: *See—*
Sugiura, Junzi; Okada, Hiroshi; Hayashi, Michitaka; Yamazaki, Toru; and Sugimoto, Hiroshi, 4,413,527., Cl. 73-754.000.

Hayashi, Yasuyuki, to Showa Manufacturing Co., Ltd. Device for adjusting the height of vehicles. 4,413,837., Cl. 280-707.000.

Hayne, Hank. Floatable fly casting weight and leader storage device. 4,413,438., Cl. 43-43.110.

Hazelett, Richard. Hitch for one-wheel cycle trailers. 4,413,835., Cl. 280-204.000.

Heath Company: *See—*
Krenz, Horst M., 4,414,298., Cl. 429-99.000.

Hebert, James G., Jr.: *See—*
Conrad, Walter W.; and Hebert, James G., Jr., 4,413,698., Cl. 180-305.000.

Heckelman, Richard W.; Marchant, Christopher E.; and Williams, Jack B., to General Electric Company. Self-testing pipeline processors. 4,414,669., Cl. 371-49.000.

Hedges, Rhey W., to Dr. Louis W. Parker. Motor protecting improved energy economizer for induction motors. 4,414,499., Cl. 318-798.000.

Heier, Karl H.; Nestler, Hans J.; Bieringer, Hermann; and Bauer, Klaus, to Hoechst AG. Composition and process for promoting the growth of crop plants. 4,414,020., Cl. 71-108.000.

Heininger, Richard T.: *See—*
Flye, Donald R.; and Heininger, Richard T., 4,413,365., Cl. 5-100.000.

Heinisch, Peter: *See—*
von der Eltz, Hans-Ulrich; Heinisch, Peter; and Ballmann, Hans J., 4,414,000., Cl. 8-555.000.

Heinrich, Gerard: *See—*
Billon, Alain; Renard, Pierre; Simandoux, Jean-Claude; and Heinrich, Gerard, 4,414,105., Cl. 208-309.000.

Hellinger, David L., to Lincoln Manufacturing Co., Inc. Method of attaching a handle to a cooking vessel. 4,413,767., Cl. 228-136.000.

Hendriks, Johannes H.; and Van Daal, Johannes J. M., to U.S. Philips Corporation. RF-Input stage. 4,414,688., Cl. 455-188.000.

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Hepburn, John J: *See—*
Moran, David P. J.; and Hepburn, John J, 4,414,236., Cl. 426-573.000.

Hepp, Vincent R., to Schlumberger Technology Corporation. Well logging system for mapping structural and sedimentary dips of underground earth formations. 4,414,656., Cl. 367-25.000.

Heraeus Quarzschmelze GmbH: *See—*
Bruning, Rolf; Breidenbach, Poul-Erik; Cibis, Norbert; Aldinger, Fritz; and Werdecker, Waltraud, 4,414,014., Cl. 65-31.000.

Hercules Incorporated: *See—*
Maslanka, William W.; and Spence, Gavin G., 4,414,353., Cl. 524-458.000.

Hering, Roland: *See—*
Weinhold, Harri; Vogel, Heinz-Rudiger; Kurze, Bernhard; Schlegel, Joachim; Rauschenbach, Dieter; Hering, Roland; Werner, Peter; and Wunsch, Heinz, 4,413,585., Cl. 118-61.000.

Hesse, Theodor; Rieke, Helmut; and Kleine-Konig, Johannes, to Engelbrecht & Lemmerbrock GmbH & Co. Pneumatic suction devices. 4,413,933., Cl. 406-152.000.

Hetet, Yves J. F.: *See—*
Ferrieu, Gilbert M. M.; Osmond, Etienne J. R.; and Hetet, Yves J. F., 4,414,434., Cl. 179-77.000.

Hettiger, James: *See—*
Tallant, James C., II; and Hettiger, James, 4,414,577., Cl. 358-242.000.

Hettinger, William P., Jr.: *See—*
Zandona, Oliver J.; and Hettinger, William P., Jr., 4,414,098., Cl. 208-120.000.

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Hilboldt, Mark S.: *See—*
Smith, Murray S., Jr.; Hilboldt, Mark S.; and Mathur, Pracheeshwar S., 4,414,178., Cl. 422-444.000.

Hilgenfeldt, Eckhard: *See—*
Schrattenholz, Walter; Hilgenfeldt, Eckhard; and Knittel, Volker, 4,414,032., Cl. 106-186.000.

Hill, Berlie R.: *See—*
Wang, Kenneth Y.; Hill, Berlie R.; and Pinson, Marvin J., Jr., 4,414,045., Cl. 156-73.200.

Hill, Eugene E.; Scrimshaw, Marvin S.; and Showalter, Edward W., to Canadian Patents and Development Limited. Thinned array transducer for sonar. 4,414,654., Cl. 367-103.000.

Hill, Richard C.; and Daniele, Mark R., to University of Maine, The Board of Trustees of the. Solid fuel hot water heater. 4,413,571., Cl. 110-234.000.

Hinuma, Minoru: *See—*
Kinoshita, Tomoo; and Hinuma, Minoru, 4,413,965., Cl. 425-71.000.

Hirabayashi, Kenji: *See—*
Shibata, Fujio; Hirabayashi, Kenji; and Mikura, Chihoto, 4,414,289., Cl. 428-695.000.

Hiraguri, Seisuke: *See—*
Hirota, Akira; Hiraguri, Seisuke; and Uchimi, Takashi, 4,414,586., Cl. 360-70.000.

Hirai, Hiroyuki: *See—*
Nakamura, Koichi; and Hirai, Hiroyuki, 4,414,305., Cl. 430-373.000.

Hiraoka, Kaoru: *See—*
Tsuchimoto, Takamitsu; Kaneda, Saburo; Miyazawa, Tatsushi; Shimada, Toshio; Suzuki, Hideo; Sanagai, Mitsuru; and Hiraoka, Kaoru, 4,414,620., Cl. 364-200.000.

Hirata, Seiichiro, to Mitsubishi Denki Kabushiki Kaisha. Radio receiver. 4,414,687., Cl. 455-165.000.

Hirate, Naoyuki: *See—*
Endo, Hiroshi; Awa, Masashi; Iiri, Shigeo; Oguchi, Toshihiko; Suzuki, Isao; Hirate, Naoyuki; and Hayashi, Masaru, 4,414,124., Cl. 252-62.630.

Hirayama, Takanobu: *See—*
Watanabe, Tomoyoshi; Hirayama, Takanobu; Yoshimura, Motokazu; Mizuno, Kenji; and Inukai, Yukio, 4,414,496., Cl. 318-696.000.

Hirayama, Tsutomu, to Toyota Jidosha Kabushiki Kaisha. Engine cooling system with optionally communicable head cooling circuit and block cooling circuit, and method of operating the same. 4,413,596., Cl. 123-41.100.

Hirota, Akira; Hiraguri, Seisuke; and Uchimi, Takashi, to Victor Company of Japan, Ltd. Pilot signal recording and reproducing system. 4,414,586., Cl. 360-70.000.

Hirota, Kunio; and Shimomura, Masao, to Brother Kogyo Kabushiki Kaisha. Stitch pattern sewing machine. 4,413,574., Cl. 112-121.120.

Hirota, Toshio, to Nissan Motor Company, Limited. Method and apparatus for starting an alcohol engine. 4,413,594., Cl. 123-3.000.

Hirsh Company: *See—*
Ferdinand, Irwin J.; Sylvan, Richard; and Peterson, Michael, 4,413,374., Cl. 16-121.000.

Hirshberg, Gerald P., to Nissan Design International, Inc. Dual deck construction for a hatchback type automobile. 4,413,854., Cl. 296-146.000.

Hitachi Denshi Kabushiki Kaisha: *See—*
Yabuuchi, Shigeru; and Endoh, Takeyuki, 4,414,640., Cl. 364-702.000.
Yamamoto, Manabu; and Tanaka, Shuhei, 4,414,575., Cl. 358-227.000.

Hitachi Koki Co., Ltd.: *See—*
Monma, Hisayoshi; Miyasaka, Masao; and Kubo, Kazuyuki, 4,413,558., Cl. 101-93.140.

Hitachi, Ltd.: *See—*
Kanamaru, Hisanobu; Tatsumi, Hideo; Sayo, Kosaku; and Okabe, Moisei, 4,413,717., Cl. 192-84.00C.
Nishizawa, Masahiko; and Fujimura, Takashi, 4,414,318., Cl. 430-24.000.
Ohno, Mitsuo; and Hatazawa, Kikuo, 4,414,556., Cl. 346-160.000.
Okamoto, Hiroshi; Kudo, Tetsuichi; and Kawamura, Go, 4,414,182., Cl. 423-652.000.
Sakurada, Hiroshi; and Aoyama, Naofumi, 4,414,545., Cl. 340-790.000.
Seki, Kunio; and Takeshita, Ritsuji, 4,414,514., Cl. 330-262.000.
Siga, Masao; Kirihara, Seishin; Kuriyama, Mitsuo; Yosioka, Takatoshi; Takahashi, Shintaro; and Yoshida, Takehiko, 4,414,024., Cl. 75-126.00C.
Yabuuchi, Shigeru; and Endoh, Takeyuki, 4,414,640., Cl. 364-702.000.

Hitachi Shipbuilding & Engineering Company Limited: *See—*
Imaoka, Hiroshi; Sakiyama, Michio; and Yamamoto, Masahiro, 4,413,498., Cl. 72-405.000.

Hitchcock, James E., to Magnavox Consumer Electronics Company. Nonlinear edge peaking system and method. 4,414,564., Cl. 358-37.000.

Hitzman, Donald O., to Phillips Petroleum Company. Oxygen scavenging with enzymes. 4,414,334., Cl. 435-262.000.

Hizuka, Kenji: *See—*
Shimizu, Nobuyoshi; Saijo, Kinji; Hizuka, Kenji; Inui, Tsuneo; and Kondo, Yoshikazu, 4,414,078., Cl. 204-34.000.

Ho, Eugene Y., to Techne Electronics Limited. Motion sensing system. 4,414,541., Cl. 340-566.000.

Hobbs, Howard F., to Variable Kinetic Drives Limited. Power transmission apparatus. 4,413,535., Cl. 74-688.000.

Hock, Hans: *See—*
Pichler, Gunther; Rothhaas, Friedrich; and Hock, Hans, 4,413,869., Cl. 312-236.000.

Hockersmith, Harold M., to Hoffco, Inc. Lawn mower blade retainer. 4,413,468., Cl. 56-295.000.

Hoda, Syed N., to Corning Glass Works. Glass-ceramic articles having metallic surfaces. 4,414,281., Cl. 428-433.000.

Hodgen, Gary D.: *See—*
Wellner, Edward; Michejda, Maria; and Hodgen, Gary D., 4,413,985., Cl. 604-9.000.

Hoechst AG: *See—*
Heier, Karl H.; Nestler, Hans J.; Bieringer, Hermann; and Bauer, Klaus, 4,414,020., Cl. 71-108.000.
von der Eltz, Hans-Ulrich; Heinisch, Peter; and Ballmann, Hans J., 4,414,000., Cl. 8-555.000.

Hoechst Aktiengesellschaft: *See—*
Erpenbach, Heinz; Gehrmann, Klaus; Lork, Winfried; and Prinz, Peter, 4,414,160., Cl. 260-544.00A.
Schrattenholz, Walter; Hilgenfeldt, Eckhard; and Knittel, Volker, 4,414,032., Cl. 106-186.000.

Hoesch Werke Aktiengesellschaft: *See—*
Gross, Heinz; Reith, Friedrich; Retzlaff, Friedhelm; and Schlusnus, Karl H., 4,414,042., Cl. 148-12.00R.

Hoffco, Inc.: *See*—
Hockersmith, Harold M., 4,413,468., Cl. 56-295.000.
Hoffert, Robert S.: *See*—
Moyer, James D.; and Hoffert, Robert S., 4,413,580., Cl. 112-262.200.
Hoffman Controls Corporation: *See*—
Bowman, William W., 4,413,514., Cl. 73-204.000.
Hoffman, David M.; Pritzkow, Dennis; and Lang, George R., to General Electric Company. Resilient mount for modular detector cell. 4,414,473., Cl. 250-366.000.
Hoffman, Ronald E.; and Freed, William K., to Goodyear Tire & Rubber Company, The. Vehicle geometry checking apparatus. 4,413,420., Cl. 33-180.0AT.
Hoffmann-La Roche Inc.: *See*—
Uskokovic, Milan R.; and Wovkulich, Peter M., 4,414,402., Cl. 549-475.000.
Hoffmann, Peter; Hugel, Helmut; Schall, Wolfgang; and Schock, Wolfram, to Deutsche Forschungs- und Versuchsanstalt fur Luft-und Raumfahrt e.V. Apparatus for producing a discharge in a supersonic gas flow. 4,414,488., Cl. 315-39.000.
Hogue, Norman E., to Packard Industries, Inc. Furniture lock. 4,413,489., Cl. 70-81.000.
Hohmann, Eugen: *See*—
Quella, Ferdinand; and Hohmann, Eugen, 4,414,241., Cl. 427-2.000.
Hohmann, Robert P.: *See*—
Krug, Russell R.; and Hohmann, Robert P., 4,414,100., Cl. 208-153.000.
Hok, Bertil; and Sall, Gosta, to Siemens Aktiengesellschaft. Miniature pressure transducer. 4,413,528., Cl. 73-753.000.
Hold, Peter; and Tadmor, Zehev, to USM Corporation. Method for processing plastic and polymeric materials. 4,413,913., Cl. 366-75.000.
Holm, Robert O.: *See*—
Kellogg, Harvey J.; and Holm, Robert O., 4,413,447., Cl. 51-170.0PT.
Holtorf, Franz-Josef: *See*—
Niwiera, Wolfgang; Holtorf, Franz-Josef; and Biederer, Hans H., 4,413,768., Cl. 228-173.00A.
Holzapfel, Wolfgang, to Honeywell Inc. Laser range meter. 4,413,905., Cl. 356-5.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Inoue, Kazuo; Narisawa, Ryo; Wada, Ryuji; Sato, Toshihiko; and Irino, Hiroshi, 4,413,602., Cl. 123-486.000.
Otani, Junji; Ikenoya, Yasuo; and Iwashita, Kanau, 4,413,392., Cl. 29-157.00R.
Shiratsuchi, Koji, 4,413,700., Cl. 180-219.000.
Honeywell, Inc.: *See*—
Crist, Scott D., 4,414,652., Cl. 367-93.000.
Holzapfel, Wolfgang, 4,413,905., Cl. 356-5.000.
Lai, Juey H., 4,414,313., Cl. 430-295.000.
Honeywell Information Systems Inc.: *See*—
Nowell, John R., 4,414,598., Cl. 361-18.000.
Ryan, Joseph L.; and Winfrey, Gerald N., 4,414,645., Cl. 364-900.000.
Stanley, Philip E., 4,414,637., Cl. 364-569.000.
Honma, Ichiro: *See*—
Miyazawa, Kokichi; Nakata, Kazuo; Ishikawa, Tsuneo; Honma, Ichiro; Koyama, Arata; and Amano, Masatoshi, 4,414,245., Cl. 427-127.000.
Hooker, Ross B., III, to International Business Machines Corporation. Scanned light beam imaging method and apparatus. 4,414,583., Cl. 358-300.000.
Horie, Masao; Sunada, Yusuke; and Inari, Junta, to Sony Corporation. Microphone output transmission circuit. 4,414,433., Cl. 179-70.000.
Horie, Tatsuo: *See*—
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Horigome, Eiji: *See*—
Kawahara, Hiroshi; Azegami, Hitoshi; and Horigome, Eiji, 4,414,288., Cl. 428-694.000.
Horike, Akihiro: *See*—
Iwata, Kaoru; Nishihara, Toshio; Ohe, Michisuke; Saito, Yoichi; and Horike, Akihiro, 4,414,254., Cl. 428-34.000.
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Geel, Zane H.; Hornby, Roger B.; Lipps, Bennie J.; Savage, Charles E.; and Vanat, Pierre, 4,414,110., Cl. 210-321.300.
Hoshino, Minoru: *See*—
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Howaldtswerke-Deutsche Werft Aktiengesellschaft Hamburg und Kiel: *See*—
Pietsch, Gunter, 4,413,829., Cl. 277-3.000.
Pietsch, Gunter, 4,413,830., Cl. 277-27.000.
Howard, H. Taylor, to Chaparral Communications, Inc. Polarized signal receiver system. 4,414,516., Cl. 333-21.00A.
Howell, Jones V.: *See*—
Miller, William R.; and Howell, Jones V., 4,414,593., Cl. 360-102.000.
Hruda, Robert M., to Westinghouse Electric Corp. Low DC voltage, high current switch assembly. 4,414,447., Cl. 200-144.00B.
Hubecker, Hans; Lenze, Friedrich; and Missaire, Gerhard, to Mannesmann Aktiengesellschaft. Method for surface treatment of threading. 4,414,247., Cl. 427-230.000.
Huffman, William F.; and Wilson, James W., to SmithKline Beckman Corporation. Pharmaceutical composition and methods for producing dopamine agonist activity. 4,414,224., Cl. 424-274.000.
Hugel, Helmut: *See*—
Hoffmann, Peter; Hugel, Helmut; Schall, Wolfgang; and Schock, Wolfram, 4,414,488., Cl. 315-39.000.
Huggins, Harold D.: *See*—
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Hughes Aircraft Company: *See*—
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Basiulis, Algerd, 4,413,671., Cl. 165-1.000.
Myer, John H., 4,413,500., Cl. 72-465.000.
Myer, Jon H., 4,413,635., Cl. 128-782.000.
Hughes, Robert W.; and Cantrel, James F., to Ingersoll-Rand Co. Plural-part earth bit, and an improved bit head therefor. 4,413,689., Cl. 175-409.000.
Hughes Tool Company: *See*—
McKenzie, Lee F., 4,413,681., Cl. 166-293.000.
Huhns, Michael N.: *See*—
Summer, Charles F., Jr.; Pettus, Robert O.; Bonnell, Ronald D.; Huhns, Michael N.; and Stephens, Larry M., 4,414,624., Cl. 364-200.000.
Huignard, Jean-Pierre: *See*—
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Huisentruit, Gordon A.: *See*—
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Hulterstrum, Harold D.: *See*—
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Hune, R. G., to Thermal Designs, Inc. Fireproof enclosure for valve actuator. 4,413,683., Cl. 169-48.000.
Hung, William M.: *See*—
Schmidt, Paul J.; and Hung, William M., 4,414,399., Cl. 549-309.000.
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Cook, Peter B.; and Hunt, John H., 4,414,209., Cl. 424-243.000.
Hunter, Gary L.; Marason, Gabriel, Jr.; and Troup, Diana C., to Mattel, Inc. Multiple function doll. 4,413,441., Cl. 46-116.000.
Huon de Kermadec, Jean, to Soule Fer et Froid S.A. Method of automatically operating a semi-continuous passenger transport system using passive vehicles, and means for implementing same. 4,413,568., Cl. 104-20.000.
Hurnaus, Rudolf: *See*—
Sauter, Robert; Griss, Gerhart; Grell, Wolfgang; Hurnaus, Rudolf; Eisele, Bernhard; Haarmann, Walter; and Rupprecht, Eckhard, 4,414,225., Cl. 424-274.000.
Hutchins, Richard D.: *See*—
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Hydro-Plan Engineering Ltd.: *See*—
Mehoudar, Raphael, 4,413,786., Cl. 239-542.000.
Hydropress Wallander & Co. AB: *See*—
Wallander, Carl-Otto, 4,413,554., Cl. 100-43.000.
Iba, Akio, to Casio Computer Co., Ltd. Synchro start device for electronic musical instruments. 4,413,543., Cl. 84-1.030.
Ichikawa, Yoshio; and Halgas, George M., to Westinghouse Electric Corp. Shaped ceramics. 4,414,337., Cl. 501-103.000.
Igarashi, Yukio, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor thyristor device with laterally displaced auxiliary and main cathode regions. 4,414,559., Cl. 357-38.000.
Iguchi, Sei: *See*—
Sasaki, Hiroaki; Inoue, Testuya; Mineo, Yoshiharu; Iguchi, Sei; Makita, Kazuhide; Arai, Hiroshi; Itoh, Hajime; Ohta, Hisatoshi; Inazu, Masahiro; and Kawahashi, Akira, 4,413,424., Cl. 33-361.000.
Ii, Akira; Sasano, Mitunori; Morishita, Michio; Kuno, Mikio; and Kadowaki, Kunio, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisan Industry Co., Ltd. Air valve type twin compound carburetor for engines. 4,414,162., Cl. 261-23.00A.
Iida, Atsuo: *See*—
Murakami, Keiichi; Amemiya, Shinichi; Miyazaki, Junji; Yanashima, Tadahiko; Iida, Atsuo; Shimura, Takaki; Miwa, Hirohide; and Midorikawa, Norio, 4,413,520., Cl. 73-609.000.
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Iiri, Shigeo: *See*—
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Ijima, Takeshi, to Iida Kensetsu Co., Ltd. Blocks for constructing a breakwater. 4,413,924., Cl. 405-31.000.
Ikeda, Kunihiko: *See*—
Karasawa, Shuichi; Matsumoto, Fuyuhiko; Tsushima, Shuichi; Saitou, Masatoshi; Ishida, Tsutomu; Ikeda, Kunihiko; Yoshikawa, Masao; and Sato, Tsutomu, 4,413,899., Cl. 355-4.000.
Ikenoya, Yasuo: *See*—
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Ikushima, Koichi; Tanaka, Hirokazu; Osamu, Ohe; Kino, Eiku; Kobsaka, Masanobu; Aoki, Hatsuo; Arakawa, Akira; and Imanak[illegible]iroshi, to Fujisawa Pharmaceutical Co., Ltd. 1,4-Naphtoquinon[illegible]vatives and their use in treating coccidiosis. 4,414,226., Cl. 424-[illegible]0.

Ima, Seiichiro: *See*—
Shiga, Akinobu; Matsuyama, Kiyoshi; Kakugo, Masahiro; Naito, Yukio; Ima, Seiichiro; and Yamashita, Katsuyoshi, 4,414,373., Cl. 526-348.000.

Imai, Mamoru: *See*—
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Imanaka, Hiroshi; Miyoshi, Toshio; Konomi, Toshio; Kubochi, Yoshiaki; Hattori, Seiziro; and Kawakita, Takeshi, to Fujisawa Pharmaceutical Co., Ltd. Process for the preparation of deacetylcephalosporin C. 4,414,328., Cl. 435-47.000.

Imanaka, Hiroshi: *See*—
Ikushima, Koichi; Tanaka, Hirokazu; Osamu, Ohe; Kino, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; Arakawa, Akira; and Imanaka, Hiroshi, 4,414,226., Cl. 424-279.000.

Imaoka, Hiroshi; Sakiyama, Michio; and Yamamoto, Masahiro, to Hitachi Shipbuilding & Engineering Company Limited. Rotary transfer press. 4,413,498., Cl. 72-405.000.

Imoto, Tadasi: *See*—
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Imperial Chemical Industries PLC: *See*—
Cartwright, David; and Turnbull, Michael, 4,414,391., Cl. 546-302.000.
Griffin, Brian P.; and MacDonald, William A., 4,414,381., Cl. 528-190.000.
Nield, Eric; and Thompson, Martin K., 4,414,358., Cl. 524-538.000.

Inaga, Hisashi; and Fukuoka, Takashi, to Kioritz Corporation. Exhaust muffler for a two-cycle opposed cylinder engine. 4,413,705., Cl. 181-240.000.

Inagaki, Nobuo: *See*—
Suto, Shoichi; Suda, Hiroyuki; Hanawa, Fumiaki; Nakahara, Motohiro; and Inagaki, Nobuo, 4,414,012., Cl. 65-18.200.

Inanaga, Takugi: *See*—
Komatsubara, Masahiro; Kamimura, Tetsuro; Inanaga, Takugi; and Takahashi, Akira, 4,413,793., Cl. 242-68.000.

Inari, Junta: *See*—
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Inazu, Masahiro: *See*—
Sasaki, Hiroaki; Inoue, Testuya; Mineo, Yoshiharu; Iguchi, Sei; Makita, Kazuhide; Arai, Hiroshi; Itoh, Hajime; Ohta, Hisatoshi; Inazu, Masahiro; and Kawahashi, Akira, 4,413,424., Cl. 33-361.000.

Indola Cosmetics B.V.: *See*—
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Industrial Automation Corporation: *See*—
Peyton, John J.; Thomason, Robert L.; and Evinger, Hubert W., 4,414,566., Cl. 358-101.000.

Ingersoll-Rand Co.: *See*—
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Inmos Corporation: *See*—
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Inoue, Akio: *See*—
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Inoue-Japax Research Incorporated: *See*—
Inoue, Kiyoshi, 4,414,028., Cl. 419-31.000.
Inoue, Kiyoshi, 4,414,456., Cl. 219-69.00W.

Inoue, Kazuo; Narisawa, Ryo; Wada, Ryuji; Sato, Toshihiko; and Irino, Hiroshi, to Honda Giken Kogyo Kabushiki Kaisha. Fuel injection control apparatus for internal combustion engine. 4,413,602., Cl. 123-486.000.

Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Method of and apparatus for sintering a mass of particles with a powdery mold. 4,414,028., Cl. 419-31.000.

Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Electroerosive wire-cutting method and apparatus with a shaped high-velocity stream of a cutting liquid medium. 4,414,456., Cl. 219-69.00W.

Inoue, Testuya: *See*—
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Koyama, Hiroaki; and Shimizu, Shigeo, 4,414,379., Cl. 528-137.000.

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Kawakita, Takeshi: *See*—
Imanaka, Hiroshi; Miyoshi, Toshio; Konomi, Toshio; Kubochi, Yoshiaki; Hattori, Seiziro; and Kawakita, Takeshi, 4,414,328., Cl. 435-47.000.

Kawakubo, Katsuhiko: *See*—
Konotsune, Takuo; and Kawakubo, Katsuhiko, 4,414,392., Cl. 548-105.000.

Kawamura, Go: *See*—
Okamoto, Hiroshi; Kudo, Tetsuichi; and Kawamura, Go, 4,414,182., Cl. 423-652.000.

Kawamura, Naoto: *See*—
Kato, Yuzo; Ishihara, Shunichi; Sato, Yasushi; Tanaka, Nobuyoshi; Kawamura, Naoto; and Nakatsui, Hisashi, 4,414,581., Cl. 358-280.000.

Kawamura, Yoshihisa; and Yasuhara, Seishi, to Nissan Motor Company, Ltd. Adjusting system for crank angle sensor. 4,413,508., Cl. 73-116.000.

Kawasaki, Kiyoshi: *See*—
Fukushima, Tsutomu; Kawasaki, Kiyoshi; and Sasaki, Sadayuki, 4,414,026., Cl. 75-130.500.

Kawasumi, Keiichi: *See*—
Watanabe, Ryozo; Kawasumi, Keiichi; Maeda, Shoichi; and Shoji, Takashi, 4,414,336., Cl. 436-502.000.

Kazumi, Ozawa; and Shinichiro, No, to Kabushiki Kaisha Yakult Honsha. Constant-speed conveyor apparatus. 4,413,709., Cl. 198-344.000.

Kazuse, Yoshitaka: *See*—
Iwama, Akio; and Kazuse, Yoshitaka, 4,414,157., Cl. 260-428.500.

Kearney & Trecker Corporation: *See*—
Kuczenski, Steven R., 4,413,938., Cl. 409-233.000.

Keck, Max H.: *See*—
Gloth, Richard E.; Tazuma, James J.; and Keck, Max H., 4,414,348., Cl. 524-255.000.

Kehrer, Hans-Peter: *See*—
Drew, Jeffrey-Michael; Seitz, Max-Gerhard; Kehrer, Hans-Peter; and Eichelbroenner, Gottfried, 4,413,507., Cl. 73-104.000.

Keil, Hans S. H., deceased (by Keil, Inge, legal representative); Alfs, Helmut; and Schulze, Klaus, to Chemische Werke Huels Aktiengesellschaft. Alkali metal or amine salts of a mixture of 2- and 3-alkyladipic acids as corrosion inhibitors. 4,414,125., Cl. 252-75.000.

Keil, Inge, legal representative: *See*—
Keil, Hans S. H., deceased; Alfs, Helmut; and Schulze, Klaus, 4,414,125., Cl. 252-75.000.

Kelley, Jack M. Electrical circuit test probe. 4,414,506., Cl. 324-158.00P.

Kellogg, Harvey J.; and Holm, Robert O. Groove refinishing tool. 4,413,447., Cl. 51-170.0PT.

Kelsey-Hayes Company: *See*—
Jones, Brian H., 4,414,049., Cl. 156-166.000.

Kelson, Arthur F. Trash bag caddy. 4,413,800., Cl. 248-99.000.

Kempf, Volker: *See*—
Tomoff, Toma; Mohr, Hans G.; and Kempf, Volker, 4,413,534., Cl. 73-864.210.

Kendall Company, The: *See*—
Tucker, Samuel M., 4,413,620., Cl. 128-134.000.

Kennametal Inc.: *See*—
Newman, Harold C.; and Stoll, William M., 4,414,029., Cl. 75-252.000.

Kennedy, Howard L., to Motorola Inc. Fractional doppler counting. 4,414,504., Cl. 324-78.00R.

Keramidas, Vassilis G.; McCoy, Robert J.; and Temkin, Henryk, to Bell Telephone Laboratories, Incorporated. Beryllium-gold ohmic contact to a semiconductor device. 4,414,561., Cl. 357-67.000.

Kern, Kenneth C., to Exxon Research and Engineering Co. Manifold to uniformly distribute a solid-liquid slurry. 4,413,934., Cl. 406-155.000.

Kerr-McGee Chemical Corporation: *See*—
Riggs, Olen L., Jr., 4,413,408., Cl. 29-825.000.

Kervagoret, Gilbert, to Societe Anonyme DBA. Torque-amplifying servo-mechanism with compact structure for power steering systems. 4,413,962., Cl. 418-186.000.

Kervin, Kendall G., to Well Research, Inc. Oil well monitoring device. 4,413,676., Cl. 166-53.000.

Kessler, Milton; and Ullman, Myron E., to Kessler Products Co., Inc. Pinch cap. 4,413,748., Cl. 220-281.000.

Kessler Products Co., Inc.: *See*—
Kessler, Milton; and Ullman, Myron E., 4,413,748., Cl. 220-281.000.

Kester, Bruce J.: *See*—
Beugelsdyk, Anthony F.; Stuchlik, Terence J.; and Kester, Bruce J., 4,413,466., Cl. 56-11.300.

Ketterson, John B.: *See*—
Abraham, Bernard M.; Miyano, Kenjiro; and Ketterson, John B., 4,413,506., Cl. 73-64.400.

Keystone International, Inc.: *See*—
Schils, Petrus J. R., 4,413,393., Cl. 29-157.10R.

Khait, Klementina F.: *See*—
Falk, John C.; and Khait, Klementina F., 4,414,342., Cl. 523-437.000.

Kigawa, Tomio; and Fukui, Kouetsu, to Kubota, Ltd. Rock bolt. 4,413,929., Cl. 405-260.000.

Kiley, Richard F.; and Larson, Ralph I., to Thermal Associates, Inc. Semiconductor heat sink assembly including thermally responsive means for increasing compression as the temperature of said assembly increases. 4,414,562., Cl. 357-81.000.

Kimoto, Kyoji; and Miyauchi, Hirotsugu, to Asahi Kasei Kogyo Kabushiki Kaisha. Cation exchange membrane. 4,414,338., Cl. 521-27.000.

Kimura, Kenji; Sugamori, Shigeru; Ishikawa, Kohji; and Narumi, Naoaki, to Nippon Telegraph & Telephone Public Corp.; and Takeda Riken Kogyo Kabushikikaisha. Semiconductor memory device test apparatus. 4,414,665., Cl. 371-21.000.

Kimura, Tadashi, to Olympus Optical Co., Ltd. Zoom lens system. 4,413,887., Cl. 350-426.000.

King Energy Systems, Inc.: *See*—
Pitts, Elvin C.; Burns, Walter G.; and Anderson, Harvey R., 4,413,618., Cl. 126-450.000.

King, Merlson J.; and Wood, John E., Jr. Reflective golf ball putter alignment device. 4,413,824., Cl. 273-163.00R.

Kinnunen, Seppo T.: *See*—
Peuhkurinen, Eino J.; Linnanketo, Erkki J.; Farm, Kari M. U.; Kivisto, Tuomo V. J.; Koho, Tauno T.; Kinnunen, Seppo T.; and Taskinen, Martti P., 4,413,495., Cl. 72-196.000.

Kino, Eiko: *See*—
Ikushima, Koichi; Tanaka, Hirokazu; Osamu, Ohe; Kino, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; Arakawa, Akira; and Imanaka, Hiroshi, 4,414,226., Cl. 424-279.000.

Kinoshita, Tomoo; and Hinuma, Minoru, to Nihon Repromachine Kogyo Kabushiki Kaisha. Pelletizing device for plastic material. 4,413,965., Cl. 425-71.000.

Kinugasa, Yukio: *See*—
Matsuoka, Hiroki; Kinugasa, Yukio; and Yaegashi, Takehisa, 4,413,601., Cl. 123-480.000.

Kioritz Corporation: *See*—
Inaga, Hisashi; and Fukuoka, Takashi, 4,413,705., Cl. 181-240.000.

Kipp, Carl E., Jr., to Paygro, Inc. Composting system with movable process cars. 4,414,335., Cl. 435-313.000.

Kira, Gene S.; and Sorensen, Jens O. Geographically positioned, environmental, solar humidification energy conversion. 4,413,476., Cl. 60-641.800.

Kirihara, Seishin: *See*—
Siga, Masao; Kirihara, Seishin; Kuriyama, Mitsuo; Yosioka, Takatoshi; Takahashi, Shintaro; and Yoshida, Takehiko, 4,414,024., Cl. 75-126.00C.

Kiriyama, Tsutomu; Norota, Susumu; Segawa, Yasuhiko; Emi, Shingo; Imoto, Tadasi; and Azumi, Toshinori, to Teijin Limited. Novel assembly of composite fibers. 4,414,276., Cl. 428-374.000.

Kirjavainen, Alvi, to Valmet OY. Headbox of a paper machine. 4,414,062., Cl. 162-336.000.

Kirley, Joseph F. Aerosol insect exterminator device. 4,413,756., Cl. 222-402.110.

Kistner, Heinz: *See*—
Becker, Werner; and Kistner, Heinz, 4,414,054., Cl. 156-384.000.

Kitaguchi, Nobuya: *See*—
Yamataka, Kazunori; Isoya, Toshiro; and Kitaguchi, Nobuya, 4,414,079., Cl. 204-75.000.

Kitamoto, Tatsuji; Shirahata, Ryuji; Yamada, Yasuyuki; and Akashi, Goro, to Fuji Photo Film Co., Ltd. Magnetic recording medium and method of preparation thereof. 4,414,271., Cl. 428-328.000.

Kitamoto, Tatsuji: *See*—
Miyoshi, Takahito; Okutu, Toshimitu; Akashi, Goro; Kitamoto, Tatsuji; and Fujiyama, Masaaki, 4,414,270., Cl. 428-325.000.

Kitamura, Koichiro, to Kitamura Machinery Co. Ltd. Apparatus for detecting the position of a machine tool spindle. 4,413,422., Cl. 33-185.00R.

Kitamura Machinery Co. Ltd.: *See*—
Kitamura, Koichiro, 4,413,422., Cl. 33-185.00R.

Kivisto, Tuomo V. J.: *See*—
Peuhkurinen, Eino J.; Linnanketo, Erkki J.; Farm, Kari M. U.; Kivistq, Tuomo V. J.; Koho, Tauno T.; Kinnunen, Seppo T.; and Taskinen, Martti P., 4,413,495., Cl. 72-196.000.

Kiwalle, Jozef; Galloway, James H.; and Rowan, John W., to Energy Development Associates, Inc. Metal halogen battery system. 4,414,292., Cl. 429-19.000.

Klak, Roland; Frankle, Gerhard; and Woschee, Dieter, to Daimler-Benz Aktiengesellschaft. Heating device for preheating combustion air for an internal combustion engine. 4,413,606., Cl. 123-550.000.

Klapp, Eberhard, deceased: *See*—
Drude, Burkhard; Peters, Thomas; and Klapp, Eberhard, deceased, 4,414,114., Cl. 210-652.000.

Klapp, Ursula, executrix: *See*—
Drude, Burkhard; Peters, Thomas; and Klapp, Eberhard, deceased, 4,414,114., Cl. 210-652.000.

Klein, Thomas; Varadi, Andrew G.; and Boettcher, Charles E., to National Semiconductor Corporation. Method for making a semiconductor capacitor. 4,413,401., Cl. 29-571.000.

Kleine-Konig, Johannes: *See*—
Hesse, Theodor; Rieke, Helmut; and Kleine-Konig, Johannes, 4,413,933., Cl. 406-152.000.

Klempner, Daniel; and Frisch, Kurt C., to American Cyanamid Company. Reaction injection molding compositions and process. 4,414,174., Cl. 264-328.600.

Klibanov, Alexander M.; and Langer, Robert S., to Massachusetts Institute of Technology. Methods of decreasing the hydrophobicity of fibroblast and other interferons. 4,414,147., Cl. 260-112.00R.

Klie, Jurgen; Lubos, Walter; and Flieter, Wilhelm, to G. Dusterloh GmbH. Hydraulic motor with adjustable flow volume. 4,413,548., Cl. 91-491.000.

Klockner-Humboldt-Deutz AG: *See*—
Melcher, Gerhard, 4,414,022., Cl. 75-26.000.
Schmidt, Martin; Kohler, Walter; Loch, Hans-Ulrich; and Weber, Albrecht, 4,414,186., Cl. 423-175.000.

Knable, Raymond J., to Parker-Hannifin Corporation. Limit switch actuator for fluid cylinders. 4,413,549., Cl. 92-5.00R.

Knapheide Mfg. Co., The: *See*—
Leaver, John Y.; and Huggins, Harold D., 4,413,848., Cl. 292-59.000.

Knapp, William; Dunn, William; and Smith, Kent F., to General Instrument Corporation. Storage logic array having two conductor data column. 4,414,547., Cl. 340-825.830.

Kneller, Eckhart; Koenig, Roland; Koester, Eberhard; Grau, Werner; and Mayer, Dieter, to BASF Aktiengesellschaft. Magnetic recording medium and its manufacture. 4,414,287., Cl. 428-650.000.

Kniep, Claus: *See*—
Weber, Jurgen; Falk, Volker; and Kniep, Claus, 4,414,419., Cl. 568-421.000.

Knifton, John F.: *See*—
Lin, Jiang-Jen; and Knifton, John F., 4,414,410., Cl. 560-265.000.

Knittel, Volker: *See*—
Schrattenholz, Walter; Hilgenfeldt, Eckhard; and Knittel, Volker, 4,414,032., Cl. 106-186.000.

Knoll International, Inc.: *See*—
Haigh, Paul, 4,413,570., Cl. 108-153.000.

Knop, Hans-Georg: *See*—
Gast, Uwe; Jung, Eggert; Kuhn, Franz; Mollgaard, Klaus; Redecker, Friedrich; Sendtko, Ulrich; Sommer, Rudiger; Wellendorf, Klaus; and Knop, Hans-Georg, 4,414,635., Cl. 364-526.000.

Kobak, Joseph, to Broken Hill Proprietary Company Limited, The. Pneumatic conveyors for flow of gas-borne particulate material. 4,413,932., Cl. 406-138.000.

Kobari, Yukio: *See*—
Kashimoto, Yutaka; Sakuma, Shinzo; Warabi, Junichi; Kobari, Yukio; and Kawaguchi, Hidemi, 4,414,448., Cl. 200-144.00B.

Kobayashi, Hisao: *See*—
Kato, Kimio; Kobayashi, Hisao; Mukai, Takamitsu; Kono, Hiroya; and Yamamoto, Taku, 4,413,955., Cl. 417-270.000.

Kobayashi, Sumio, to Tokyo Shibaura Denki Kabushiki Kaisha. Arrester and a semiconductor circuit arrangement with a protection device including the same. 4,414,599., Cl. 361-56.000.

Kochs Adler AG: *See*—
Landwehr, Gunter; and Thiele, Horst, 4,413,582., Cl. 112-311.000.

Koenig, Roland: *See*—
Kneller, Eckhart; Koenig, Roland; Koester, Eberhard; Grau, Werner; and Mayer, Dieter, 4,414,287., Cl. 428-650.000.

Koepke, Jeffery W.: *See*—
Young, Dean A.; and Koepke, Jeffery W., 4,414,137., Cl. 502-162.000.

Koester, Eberhard: *See*—
Kneller, Eckhart; Koenig, Roland; Koester, Eberhard; Grau, Werner; and Mayer, Dieter, 4,414,287., Cl. 428-650.000.

Koga, Tadashi: *See*—
Matsumoto, Seiji; Koga, Tadashi; Fukai, Kiyoshi; and Yamamoto, Hideji, 4,414,196., Cl. 423-633.000.

Kohashi, Toru, to Yamato Scale Company, Limited. Automatic weight sorter. 4,413,739., Cl. 209-593.000.

Kohl, Paul A.: *See*—
Forrest, Stephen R.; Kohl, Paul A.; and Panock, Richard L., 4,414,066., Cl. 204-129.300.

Kohler, Walter: *See*—
Schmidt, Martin; Kohler, Walter; Loch, Hans-Ulrich; and Weber, Albrecht, 4,414,186., Cl. 423-175.000.

Koho, Tauno T.: *See*—
Peuhkurinen, Eino J.; Linnanketo, Erkki J.; Farm, Kari M. U.; Kivisto, Tuomo V. J.; Koho, Tauno T.; Kinnunen, Seppo T.; and Taskinen, Martti P., 4,413,495., Cl. 72-196.000.

Kohsaka, Masanobu: *See*—
Ikushima, Koichi; Tanaka, Hirokazu; Osamu, Ohe; Kino, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; Arakawa, Akira; and Imanaka, Hiroshi, 4,414,226., Cl. 424-279.000.

Kohyama, Mitsuaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Electrostatic copying apparatus. 4,413,897., Cl. 355-3.0CH.

Koken Co., Ltd.: *See*—
Akiyama, Taichiro; and Wada, Fumio, 4,413,359., Cl. 3-1.000.

Kokotailo, George T.; Rohrman, Albert C., Jr.; and Sawruk, Stephen, to Mobil Oil Corporation. Modification of catalytic activity of synthetic zeolites. 4,414,189., Cl. 423-328.000.

Kolibas, James A., to Nordson Corporation. Method for the striping of the inside seam of a can body moving at a high speed. 4,414,248., Cl. 427-236.000.

Kollar, Ernest P., to International Business Machines Corporation. Recirculating automatic document feeder. 4,413,901., Cl. 355-3.0SH.

Kollmann, Horst, to Schelling & Co., Firma. Machine tool support table and feeding device. 4,413,941., Cl. 414-35.000.

Kolmar Laboratories, Inc.: *See—*
Murphy, John H.; Packer, Jon D.; and Brown, Dennis R., 4,414,200., Cl. 424-63.000.

Kolyada, Vladimir A.: *See—*
Axenko, Alexandr A.; Nazarian, Miron M.; Kolyada, Vladimir A.; Mataev, Arkady R.; and Shamsha, Ljudmila F., 4,414,091., Cl. 204-277.000.

Komatsubara, Masahiro; Kamimura, Tetsuro; Inanaga, Takugi; and Takahashi, Akira, to Pioneer Electronic Corporation. Cassette tape machine. 4,413,793., Cl. 242-68.000.

Komori, Minoru: *See—*
Matsuzaka, Takashi; Ohtsuki, Toshio; Komori, Minoru; and Sakuma, Tsutomu, 4,414,139., Cl. 502-72.000.

Komori Printing Machinery Co., Ltd.: *See—*
Toyoda, Hideaki, 4,413,561., Cl. 101-365.000.

Kondo, Akinobu: *See—*
Nakamura, Kazuharu; Matsumoto, Motoki; Tsuboi, Yoshimasa; Kondo, Akinobu; and Kataoka, Yoshitaka, 4,413,612., Cl. 126-92.00C.

Kondo, Yoshikazu: *See—*
Shimizu, Nobuyoshi; Saijo, Kinji; Hizuka, Kenji; Inui, Tsuneo; and Kondo, Yoshikazu, 4,414,078., Cl. 204-34.000.

Kondoh, Yoshinobu: *See—*
Matsuoka, Hideoki; and Kondoh, Yoshinobu, 4,413,841., Cl. 280-802.000.

Konishiroku Photo Industry Co., Ltd.: *See—*
Abe, Shunichi; and Akiyama, Mitsuo, 4,413,900., Cl. 355-8.000.
Hamada, Fumio, 4,414,308., Cl. 430-505.000.

Kono, Hiroya: *See—*
Kato, Kimio; Kobayashi, Hisao; Mukai, Takamitsu; Kono, Hiroya; and Yamamoto, Taku, 4,413,955., Cl. 417-270.000.

Konomi, Toshio: *See—*
Imanaka, Hiroshi; Miyoshi, Toshio; Konomi, Toshio; Kubochi, Yoshiaki; Hattori, Seiziro; and Kawakita, Takeshi, 4,414,328., Cl. 435-47.000.

Konotsune, Takuo; and Kawakubo, Katsuhiko, to Sankyo Company, Ltd. Herbicidal compositions and pyrazole derivatives. 4,414,392., Cl. 548-105.000.

Kontz, Robert F. Apparatus for making a multi-layered blown plastic container. 4,413,974., Cl. 425-523.000.

Kontz, Robert F., to Owens-Illinois, Inc. Web splicing apparatus. 4,414,048., Cl. 156-159.000.

Korpman, Ralf, to Personal Products Company. Absorbent panel suitable for use in absorbent products. 4,413,995., Cl. 604-368.000.

Kosaka, Masaki: *See—*
Suzuki, Hajime; Masuda, Ikuo; and Kosaka, Masaki, 4,414,351., Cl. 524-413.000.

Kosh, William S., to Dresser Industries, Inc. Pulsation throttling device for a pressure gauge. 4,413,524., Cl. 73-707.000.

Kostelnik, Robert J.: *See—*
Cohen, Stuart C.; Kostelnik, Robert J.; and Wambach, Allen D., 4,414,352., Cl. 524-443.000.

Kotwica, Roland, to Societe Chimiques des Charbonnages. Dehydration of maleic acid to form maleic anhydride. 4,414,398., Cl. 549-262.000.

Kovats, Tibor F. I., to Northern Telecom Limited. Optical fiber hermetic seal. 4,413,881., Cl. 350-96.200.

Koyama, Akio: *See—*
Mizoguchi, Tetsuhiko; and Koyama, Akio, 4,414,424., Cl. 174-28.000.

Koyama, Arata: *See—*
Miyazawa, Kokichi; Nakata, Kazuo; Ishikawa, Tsuneo; Honma, Ichiro; Koyama, Arata; and Amano, Masatoshi, 4,414,245., Cl. 427-127.000.

Koyama, Hiroaki; and Shimizu, Shigeo, to Mitsubishi Chemical Industries Limited. Granular or powdery phenol-formaldehyde resin and process for production thereof. 4,414,378., Cl. 528-137.000.

Koyama, Hiroaki; and Shimizu, Shigeo, to Kanebo Ltd.; and Mitsubishi Chemical Industries Limited. Granular or powdery nitrogen-containing phenol-aldehyde copolymer resin and process for production thereof. 4,414,379., Cl. 528-137.000.

Koyama, Toru: *See—*
Otake, Masayuki; Hatano, Masakatsu; Koyama, Toru; Murayama, Masayoshi; and Oshima, Kazunori, 4,414,133., Cl. 502-179.000.

Koyanagi, Nozomu: *See—*
Shionoya, Hiroshi; Arai, Haruyoshi; Koyanagi, Nozomu; and Takeuchi, Hitoshi, 4,414,201., Cl. 424-88.000.

Kraftwerk Union Aktiengesellschaft: *See—*
Kratz, Gerhard; and Marr, Erich, 4,414,475., Cl. 250-506.100.
Purr, Gerhard, 4,413,948., Cl. 415-219.00R.

Kratz, Gerhard; and Marr, Erich, to Kraftwerk Union Aktiengesellschaft. Shielding container for storing weak to medially active waste. 4,414,475., Cl. 250-506.100.

Kraul, Douglas R.; and Marshall, James W., to Motorola, Inc. Signal synchronization system. 4,414,676., Cl. 375-116.000.

Kraus, Heinz, to Dr. Johannes Heidenhain GmbH. Self supporting optical diffraction grid. 4,414,680., Cl. 378-84.000.

Krauss, Alan R.; and Gruen, Dieter M., to United States of America, Energy. First wall and limiter surfaces for plasma devices. 4,414,176., Cl. 376-136.000.

Krenz, Horst M., to Heath Company. Printed circuit board mount for batteries and the like. 4,414,298., Cl. 429-99.000.

Krippl, Kurt: *See—*
Redmer, Frank; and Krippl, Kurt, 4,413,912., Cl. 366-69.000.

Krogerus, Helge J.: *See—*
Makipirtti, Simo A. I.; Peuralinna, Mauri J.; Makitalo, Valto J.; Lilja, Launo L.; and Krogerus, Helge J., 4,413,816., Cl. 266-270.000.

Kropp, Walter, to Linde Aktiengesellschaft. Hydraulic spool valves with controlled by-pass. 4,413,650., Cl. 137-596.130.

Krug, Russell R.; and Hohmann, Robert P., to Chevron Research Company. Fluidized catalytic cracking. 4,414,100., Cl. 208-153.000.

Kubis, Charles S.; and Walter, John, to Continental Can Company, Inc. Method of forming domed end for container. 4,413,497., Cl. 72-356.000.

Kubo, Kazuyuki: *See—*
Monma, Hisayoshi; Miyasaka, Masao; and Kubo, Kazuyuki, 4,413,558., Cl. 101-93.140.

Kubo, Kunimichi: *See—*
Kuroda, Nobuyuki; Horie, Tatsuo; Matsuura, Kazuo; Kubo, Kunimichi; and Miyoshi, Mituji, 4,414,369., Cl. 526-65.000.

Kubochi, Yoshiaki: *See—*
Imanaka, Hiroshi; Miyoshi, Toshio; Konomi, Toshio; Kubochi, Yoshiaki; Hattori, Seiziro; and Kawakita, Takeshi, 4,414,328., Cl. 435-47.000.

Kubota, Ltd.: *See—*
Kigawa, Tomio; and Fukui, Kouetsu, 4,413,929., Cl. 405-260.000.

Kuczenski, Steven R., to Kearney & Trecker Corporation. Spindle motor powered drawbar. 4,413,938., Cl. 409-233.000.

Kudo, Tetsuichi: *See—*
Okamoto, Hiroshi; Kudo, Tetsuichi; and Kawamura, Go, 4,414,182., Cl. 423-652.000.

Kuhlmann, Gerhard, to Robert Bosch GmbH. Control device in a machine tool. 4,413,936., Cl. 408-8.000.

Kuhn, Franz: *See—*
Gast, Uwe; Jung, Eggert; Kuhn, Franz; Mollgaard, Klaus; Redecker, Friedrich; Sendtko, Ulrich; Sommer, Rudiger; Wellendorf, Klaus; and Knop, Hans-Georg, 4,414,635., Cl. 364-526.000.

Kulesza, Ralph J.; and Morrison, Howard J., to Marvin Glass & Associates. Toy vehicle device. 4,413,443., Cl. 46-206.000.

Kumagai, Tadanobu, to Toyota Jidosha Kabushiki Kaisha. Transmission with offset differential and deep wide groove radial ball bearing supporting intermediate shaft. 4,413,701., Cl. 180-256.000.

Kunii, Daizo. Method for thermally decomposing and gasifying combustible material in a single fluidized reactor. 4,414,001., Cl. 48-197.00R.

Kuno, Mikio: *See—*
Ii, Akira; Sasano, Mitunori; Morishita, Michio; Kuno, Mikio; and Kadowaki, Kunio, 4,414,162., Cl. 261-23.00A.

Kuntz, James P.: *See—*
Tenold, Tyrus N.; Cossette, Michael D.; Kuntz, James P.; and Gordon, Jack D., 4,413,747., Cl. 220-225.000.

Kurata, Hirotaka, to Trio Kabushiki Kaisha. High-speed playback for videodiscs. 4,414,584., Cl. 358-342.000.

Kureha, Takeshi; Kataoka, Teruo; Saeki, Taiichi; and Takeda, Minoru, to Matsushita Electric Industrial Co., Ltd. Television receiver. 4,414,571., Cl. 358-158.000.

Kuriyama, Mitsuo: *See—*
Siga, Masao; Kirihara, Seishin; Kuriyama, Mitsuo; Yosioka, Takatoshi; Takahashi, Shintaro; and Yoshida, Takehiko, 4,414,024., Cl. 75-126.00C.

Kuroda, Nobuyuki; Horie, Tatsuo; Matsuura, Kazuo; Kubo, Kunimichi; and Miyoshi, Mituji, to Nippon Oil Company, Limited. Continuous process for the preparation of polyolefins having widely distributed molecular weights. 4,414,369., Cl. 526-65.000.

Kuroda, Toyoyuki: *See—*
Ogura, Hiroyuki; and Kuroda, Toyoyuki, 4,413,484., Cl. 66-193.000.

Kurt Manufacturing Company, Inc.: *See—*
Lenz, John O., 4,413,818., Cl. 269-81.000.
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Schneider, Franz; Panknin, Walter; Belamaric, Zelimir; and Schalch, Fred, 4,414,455., Cl. 219-64.000.

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Carpenter, Daniel D.; and Lanning, Ronald L., 4,414,548., Cl. 343-8.000.

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Hamielec, Archie E.; Lawless, Grant P.; and Schultz, Harold H., 4,414,370., Cl. 526-88.000.

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Moran, David P. J.; and Hepburn, John J, 4,414,236., Cl. 426-573.000.
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Rosato, Dennis W.; and Lister, Neil K., 4,414,265., Cl. 428-285.000.

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Drude, Burkhard; Peters, Thomas; and Klapp, Eberhard, deceased, 4,414,114., Cl. 210-652.000.
Hubecker, Hans; Lenze, Friedrich; and Missaire, Gerhard, 4,414,247., Cl. 427-230.000.
Schrewe, Hans; Parschat, Lothar; Franken, Klaus; and Geisbusch, Peter, 4,413,667., Cl. 164-154.000.
Tenberg, Werner; and Pichert, Ludwig, 4,413,810., Cl. 266-94.000.

Manos, Dennis M.: *See*—
Timberlake, John R.; Ruzic, David N.; Moore, Richard L.; Cohen, Samuel A.; and Manos, Dennis M., 4,414,244., Cl. 427-105.000.

Mansor, Douglas J.: *See*—
Pemberton, Ernest H.; Riggs, Darius O.; Mansor, Douglas J.; Sager, James R.; and Juvinall, John W., 4,413,738., Cl. 209-523.000.

Manville Service Corporation: *See*—
Chin, John F.; Rhodes, Joseph A.; and Kusterer, James E., 4,414,010., Cl. 65-16.000.

Mapatent, N.V.: *See*—
Fellner, Theodore F., 4,413,724., Cl. 198-594.000.

Marason, Gabriel, Jr.: *See*—
Hunter, Gary L.; Marason, Gabriel, Jr.; and Troup, Diana C., 4,413,441., Cl. 46-116.000.

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Duke, Roy B., Jr., 4,414,119., Cl. 252-8.55D.

Marchal, Paul: *See*—
Cornu, Jean; Detriche, Jean-Marie; Tiret, Bernard; Jorge, Gerard; Galera, Richard; Biava, Dominique; and Marchal, Paul, 4,413,910., Cl. 356-377.000.

Marchant, Christopher E.: *See*—
Heckelman, Richard W.; Marchant, Christopher E.; and Williams, Jack B., 4,414,669., Cl. 371-49.000.

Marchbanks, Robert J., to National Research Development Corporation. Low volume change detection. 4,413,634., Cl. 128-746.000.

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Marmon Group, Inc., The: *See*—
Sauvey, Donald R., 4,413,544., Cl. 84-1.240.

Marquart, Gordon L.: *See*—
Michael, Richard A.; Chaudhari, Dalsang K.; and Marquart, Gordon L., 4,413,715., Cl. 192-53.00F.

Marr, Erich: *See*—
Kratz, Gerhard; and Marr, Erich, 4,414,475., Cl. 250-506.100.

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Palm, Jurgen; Glaser, Herbert; Collin, Gerd; and Marrett, Rolf, 4,414,192., Cl. 423-445.000.

Mars, Inc.: *See*—
Dean, Robert, 4,413,718., Cl. 194-1.00K.

Marschka, Frank D., to RCA Corporation. Control-screen electrode subassembly for an electron gun and method for constructing the same. 4,414,485., Cl. 313-451.000.

Marsh, Richard L.: *See*—
Wetzel, Robert E.; and Marsh, Richard L., 4,414,047., Cl. 156-138.000.

Marshall, Dale F.; and Evans, Ted C., to Dresser Industries, Inc. Vented compressor inlet guide. 4,413,946., Cl. 415-28.000.

Marshall, James W.: *See*—
Kraul, Douglas R.; and Marshall, James W., 4,414,676., Cl. 375-116.000.

Marshek, Kurt M.: *See*—
Ross, Michael O.; and Marshek, Kurt M., 4,413,513., Cl. 73-162.000.

Martin, Lawrence L.; Ong, Helen H.; Anderson, Vernon B.; and Crichlow, Charles A., to American Hoechst Corporation. Antidepressant (α-phenyl-2-tolyl)azacycloalkanols and derivatives thereof. 4,414,219., Cl. 424-267.000.

Martin, Robert A.: *See*—
Anderson, Frank E.; and Martin, Robert A., 4,414,036., Cl. 134-23.000.

Martinez, Evidio E.: *See*—
Bittaker, Gerald W.; and Martinez, Evidio E., 4,413,364., Cl. 4-661.000.

Maruyama, Masashi: *See*—
Kato, Harumitsu; Yamada, Hironori; Yamazaki, Kaoru; Maruyama, Masashi; and Ogasawara, Takashi, 4,413,703., Cl. 181-156.000.

Maruyama, Takashi: *See*—
Hanabata, Makoto; Maruyama, Takashi; and Ueno, Katsuji, 4,414,230., Cl. 426-106.000.

Maruyama, Teruo; Yamauchi, Shinya; and Abe, Yoshikazu, to Matsushita Electric Industrial Co., Ltd. Self-controllable capacity compressor. 4,413,963., Cl. 418-259.000.

Marvin Glass & Associates: *See*—
Breslow, Jeffrey D., 4,413,823., Cl. 273-153.00S.
Kulesza, Ralph J.; and Morrison, Howard J., 4,413,443., Cl. 46-206.000.

Maryland Cup Corporation: *See*—
Winstead, Thomas W., 4,413,964., Cl. 425-66.000.

Mashiko, Yoji: *See*—
Nishimura, Tadashi; and Mashiko, Yoji, 4,414,242., Cl. 427-43.100.

Maslanka, William W.; and Spence, Gavin G., to Hercules Incorporated. Organic pigments. 4,414,353., Cl. 524-458.000.

Massachusetts Institute of Technology: *See*—
Klibanov, Alexander M.; and Langer, Robert S., 4,414,147., Cl. 260-112.00R.
Wrighton, Mark S.; Ellis, Arthur B.; and Kaiser, Steven W., 4,414,300., Cl. 429-111.000.

Massey-Ferguson Industries Limited: *See*—
Crawford, Alexander, 4,413,553., Cl. 100-4.000.

Masuda, Ikuo: *See*—
Suzuki, Hajime; Masuda, Ikuo; and Kosaka, Masaki, 4,414,351., Cl. 524-413.000.

Masuda, Nobuhito, to Fuji Photo Film Co., Ltd. Method for measuring trace enzyme. 4,414,323., Cl. 435-7.000.

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Axenko, Alexandr A.; Nazarian, Miron M.; Kolyada, Vladimir A.; Mataev, Arkady R.; and Shamsha, Ljudmila F., 4,414,091., Cl. 204-277.000.

Mathur, Pracheeshwar S.: *See*—
Smith, Murray S., Jr.; Hilboldt, Mark S.; and Mathur, Pracheeshwar S., 4,414,178., Cl. 422-444.000.

Matrix Science Corporation: *See*—
Mattingly, William R., 4,413,875., Cl. 339-217.00R.

Matson, Wayne R., to Environmental Sciences Associates, Inc. Electrochemical flow cell, particularly use with liquid chromatography. 4,413,505., Cl. 73-61.10C.

Matsuda, Jinichi: *See*—
Yamashita, Tsutomu; and Matsuda, Jinichi, 4,414,487., Cl. 315-5.000.

Matsui, Fumio; and Takasu, Yutaka, to Pioneer Electronic Corporation. Heat radiation system for electronic devices. 4,414,604., Cl. 361-385.000.

Matsumoto, Fuyuhiko: *See*—
Karasawa, Shuichi; Matsumoto, Fuyuhiko; Tsushima, Shuichi; Saitou, Masatoshi; Ishida, Tsutomu; Ikeda, Kunihiko; Yoshikawa, Masao; and Sato, Tsutomu, 4,413,899., Cl. 355-4.000.

Matsumoto, Keiji, to Nippon Electric Co., Ltd. Addressing system for a computer, including a mode register. 4,414,622., Cl. 364-200.000.

Matsumoto, Motoki: *See*—
Nakamura, Kazuharu; Matsumoto, Motoki; Tsuboi, Yoshimasa; Kondo, Akinobu; and Kataoka, Yoshitaka, 4,413,612., Cl. 126-92.00C.

Matsumoto, Seiji; Koga, Tadashi; Fukai, Kiyoshi; and Yamamoto, Hideji, to Sakai Chemical Industry Co., Ltd. Method of producing single crystalline, acicular α-ferric oxide. 4,414,196., Cl. 423-633.000.

Matsuo, Kenji: *See*—
Suzuki, Yasoji; and Matsuo, Kenji, 4,414,515., Cl. 331-111.000.

Matsuoka, Hideoki; and Kondoh, Yoshinobu, to Nissan Motor Company, Limited. Safety seat belt arrangement for automotive seat occupant. 4,413,841., Cl. 280-802.000.

Matsuoka, Hiroki; Kinugasa, Yukio; and Yaegashi, Takehisa, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method for computing a compensation value for an engine having electronic fuel injection control. 4,413,601., Cl. 123-480.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Habata, Etsuroh; Ohshima, Nobumasa; and Kanatani, Kenji, 4,414,052., Cl. 156-273.700.
Kureha, Takeshi; Kataoka, Teruo; Saeki, Taiichi; and Takeda, Minoru, 4,414,571., Cl. 358-158.000.
Maruyama, Teruo; Yamauchi, Shinya; and Abe, Yoshikazu, 4,413,963., Cl. 418-259.000.
Sekido, Satoshi; Ninomiya, Yoshito; and Yamazaki, Yoshihiro, 4,414,607., Cl. 361-433.000.

Matsushita Electric Works, Ltd.: *See*—
Otsuka, Kiyotaka; and Tanahashi, Masao, 4,413,410., Cl. 30-43.600.
Yoshioka, Hideoki; Okino, Ichiro; and Toda, Toshiaki, 4,414,529., Cl. 337-365.000.

Matsutani, Yoshihide, to Miyata Industry Co., Ltd. Pressurized-fluid cartridge and safety closure therefor. 4,413,746., Cl. 220-89.00A.

Matsuura, Kazuo: *See*—
Kuroda, Nobuyuki; Horie, Tatsuo; Matsuura, Kazuo; Kubo, Kunimichi; and Miyoshi, Mituji, 4,414,369., Cl. 526-65.000.

Matsuyama, Kiyoshi: *See*—
Shiga, Akinobu; Matsuyama, Kiyoshi; Kakugo, Masahiro; Naito, Yukio; Ima, Seiichiro; and Yamashita, Katsuyoshi, 4,414,373., Cl. 526-348.000.

Matsuzaka, Takashi; Ohtsuki, Toshio; Komori, Minoru; and Sakuma, Tsutomu, to Tokyo Shibaura Denki Kabushiki Kaisha. Catalyst carriers for purification of waste gas and process for preparing the same. 4,414,139., Cl. 502-72.000.

Mattel, Inc.: *See*—
Hunter, Gary L.; Marason, Gabriel, Jr.; and Troup, Diana C., 4,413,441., Cl. 46-116.000.

Matthey, Philippe; Salmon, Robert; and Buhlmann, Niklaus, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Projectile with a tubular-shaped projectile body. 4,413,565., Cl. 102-503.000.

Matthias, Dan W.; and Miller, Collier M., to Exxon Research and Engineering Co. Printing ribbon cartridge with flexible ribbon guides. 4,413,920., Cl. 400-248.000.

Mattingly, William R., to Matrix Science Corporation. Connector retaining apparatus. 4,413,875., Cl. 339-217.00R.

Mauer, Gail B.: *See*—
Schlanger, Samuel L., 4,413,702., Cl. 180-274.000.

Mayer, Dieter: *See*—
Kneller, Eckhart; Koenig, Roland; Koester, Eberhard; Grau, Werner; and Mayer, Dieter, 4,414,287., Cl. 428-650.000.

Mayer, William R., to Stewart-Warner Corporation. Rectangular seal beam lamp and support with halogen bulb. 4,414,613., Cl. 362-267.000.

McAlister, Roy E. Stabilization of polyester. 4,414,364., Cl. 525-437.000.

McBride, Alistair D.; and Ripley, Ian S., to Emultec Limited. Recovery of heavy hydrocarbons from oil sludge. 4,413,914., Cl. 366-137.000.

McCain, Thomas S. Mud flap stabilizer device. 4,413,839., Cl. 280-154.50R.

McCarthy, Daniel J.: *See*—
De Lorenzo, Bruce L.; and McCarthy, Daniel J., 4,413,647., Cl. 137-312.000.

McCartney, Michael L., to Research Triangle Institute. Method and apparatus for displaying speech information. 4,414,431., Cl. 381-48.000.

McClary, Edward B., to Fiber Industries, Inc. Production of polyester filaments of high strength possessing an unusually stable internal structure employing improved processing conditions. 4,414,169., Cl. 264-210.700.

McCollister, Howard L.; and Reed, Scott T. Glass ceramic seals to inconel. 4,414,282., Cl. 428-433.000.

McCorcle, Gary E., to El Paso Products Company. Superheater hanger design. 4,413,591., Cl. 122-235.00R.

McCord, James W. Vapor condensate return means in a vapor generating and recovery apparatus. 4,414,067., Cl. 202-170.000.

McCoy, Robert J.: *See*—
Keramidas, Vassilis G.; McCoy, Robert J.; and Temkin, Henryk, 4,414,561., Cl. 357-67.000.

McCracken, Robert W.; and Dellas, James P., to Johnson & Johnson Products, Inc. Film dressing. 4,413,621., Cl. 128-156.000.

McCusker, Joseph H.; Thaler, Barry J.; and Tsien, Wei H., to RCA Corporation. Coating adhesion testing. 4,413,510., Cl. 73-150.00A.

McDonald, James F.: *See*—
Dattilo, Anthony J.; McDonald, James F.; and Queener, Carl A., 4,414,579., Cl. 358-256.000.

McDonald, Roderick A., to Univar Corporation. Method for treating subterranean formations. 4,413,931., Cl. 405-264.000.

McDonald, William J., to James Mackie & Sons Limited. Method and apparatus for re-cycling plastics waste. 4,413,969., Cl. 425-217.000.

McDonald, William K., to Teledyne Industries, Inc. Expanded metal containing wires and filaments. 4,414,428., Cl. 174-126.00S.

McDonnell Douglas Corporation: *See*—
Yoshida, Glenn T., 4,414,658., Cl. 369-46.000.

McFarlan, Alden I. Air conditioning system and method. 4,413,478., Cl. 62-98.000.

McKann, H. Smith, to General Products Company, Inc. Metal door and light assembly. 4,413,397., Cl. 29-416.000.

McKenzie, Lee F., to Hughes Tool Company. Method of cementing a well bore using a fluid loss additive. 4,413,681., Cl. 166-293.000.

McMahan, David R.; Zeller, Gary P.; Slaughter, Ronald W.; Skirha, Martin D.; and Bayer, Dean M., to General Motors Corporation. Hardbar energy absorbing bumper system for vehicles. 4,413,856., Cl. 296-188.000.

McMahan, David R.; and Nicholas, Richard W., to General Motors Corporation. Spring clip for a vehicle headlamp retainer member. 4,414,614., Cl. 362-269.000.

McMillin, John R.; and Strandwitz, Peter, to Cornelius Company, The. Apparatus for dispensing a carbonated beverage. 4,413,752., Cl. 222-56.000.

McMonigle, Matthew J.; and LaCamera, Alfred F., to Aluminum Company of America. Electrolysis cell for reduction of molten metal halide. 4,414,089., Cl. 204-244.000.

McNeilab, Inc.: *See*—
Rasmussen, Chris R., 4,414,211., Cl. 424-246.000.

McSweeney, Andrea. Three dimensional transformable toy. 4,413,442., Cl. 46-151.000.

Mead Corporation, The: *See*—
Wood, Prentice J., 4,413,728., Cl. 206-187.000.
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Mead Johnson & Company: *See*—
Poindexter, Graham S.; and Temple, David L., Jr., 4,414,213., Cl. 424-248.500.

Measurex Corporation: *See*—
Rice, Richard G.; Boissevain, Mathew G.; and Dubin, Robert R., 4,413,911., Cl. 356-438.000.

Meckel, Benjamin B. Magnetically-assisted sputtering method for producing vertical recording media. 4,414,087., Cl. 204-192.00M.

Meeker, James A.; and Jackson, Christopher J., to Libbey-Owens-Ford Company. Sheet handling apparatus and method. 4,413,820., Cl. 271-101.000.

Meeker, Robert G.: *See*—
Crawford, David J.; and Meeker, Robert G., 4,413,399., Cl. 29-428.000.

Mefina S.A.: *See*—
Beuchat, Roger, 4,413,563., Cl. 102-214.000.

Mehoudar, Raphael, to Hydro-Plan Engineering Ltd. Emitter unit. 4,413,786., Cl. 239-542.000.

Mehta, Kishor N.: *See*—
Payne, Larry D.; Cho, Hyun J.; and Mehta, Kishor N., 4,413,370., Cl. 15-104.06R.

Meier, Peter E.: *See*—
Studinka, Josef; and Meier, Peter E., 4,414,031., Cl. 106-90.000.

Meinsen, Edward; and Ferretti, James. Frangible lock apparatus. 4,413,493., Cl. 70-422.000.

Melcher, Gerhard, to Klockner-Humboldt-Deutz AG. Method and apparatus for smelting sulfidic ore concentrates. 4,414,022., Cl. 75-26.000.

Melichar, Jackson W.: *See*—
Varterasian, John H.; Plack, Albert R.; and Melichar, Jackson W., 4,413,838., Cl. 280-751.000.

Melillo, David G.: *See*—
Liu, Thomas M. H.; Melillo, David G.; Ryan, Kenneth M.; Shinkai, Ichiro; and Sletzinger, Meyer, 4,414,155., Cl. 260-245.20T.

Melnik, Gary A.: *See*—
Paton, Boris E.; Latash, Jury V.; Zabarilo, Oleg S.; Melnik, Gary A.; Zamulo, Nikolai I.; Zhdanovsky, Anatoly A.; Bukalo, Alfred I.; Goncharenko, Vladimir V.; Ivanchenko, Stanislav S.; Slobodian, Anatoly R.; Bakumenko, Sergei P.; and Zakamarkin, Mikhail K., 4,414,672., Cl. 373-22.000.

Mennicke, Stefan; Reiss, Karl; and Liebermann, Kurt, to Brown, Boveri & Cie AG. Electrochemical storage cell or battery. 4,414,296., Cl. 429-50.000.

Mercator Gesellschaft fur Entwicklung und Technik mbH: *See*—
Roth, Anton, deceased; and Moeller, Guenther, executor, 4,413,942., Cl. 414-253.000.

Merck & Co. Inc.: *See*—
Anderson, Paul S.; Christy, Marcia E.; Evans, Ben E.; and Remy, David C., 4,414,154., Cl. 260-245.700.
Hartman, George D., 4,414,215., Cl. 424-250.000.
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Wintermeyer, Willi; Wittmann, Rolf; and Butzke, Jurgen, 4,414,401., Cl. 549-370.000.

Merdian, Anton W., Jr.; Jurneke, Joseph K.; and Pinteric, Frank W., to Storage Technology Corporation. Media interchange switch for magnetic disk drives. 4,414,590., Cl. 360-97.000.

Mestroni, Giovanni; Zassinovich, Grazia; and Camus, Annamaria, to Montedison, S.p.A. Process for the catalytic reduction of unsaturated ketones. 4,414,417., Cl. 568-315.000.

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Venuso, Nicholas A., 4,413,419., Cl. 33-174.00G.

Mettenbrink, Herbert, to Bramlage GmbH. Dispenser for pasty compositions. 4,413,759., Cl. 222-213.000.

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Mewburn-Crook, Dominic T.: *See*—
Mewburn-Crook, Anthony J. S.; and Mewburn-Crook, Dominic T., 4,414,477., Cl. 290-55.000.

Meyer, Carl R.: *See*—
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Meyer, Carol S.: *See*—
Witte, Donald H., 4,413,453., Cl. 52-127.100.

Meyer, Jacques: *See*—
Bernelin, Daniel; and Meyer, Jacques, 4,414,279., Cl. 428-413.000.

Meyer, Jerome W., to Singer Company, The. Ordering system for pairing feature intersections on a simulated radar sweepline. 4,414,643., Cl. 364-900.000.

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Wells, William E., Jr.; Marcum, S. Douglas; Downes, Lawrence W.; and Tilton, Richard A., 4,414,671., Cl. 372-73.000.

Michael, Bayard H., to Total Shooting Systems, Inc. Tree step. 4,413,706., Cl. 182-91.000.

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Michaelson, Joseph. Rapidly disintegrable tablet composition and method. 4,414,198., Cl. 424-44.000.

Michejda, Maria: *See*—
Wellner, Edward; Michejda, Maria; and Hodgen, Gary D., 4,413,985., Cl. 604-9.000.

Michel, Rudolph H., to Du Pont de Nemours, E. I., and Company. Tetrafluoroethylene copolymer. 4,414,356., Cl. 524-496.000.

Michetti, Louis C., to Container Corporation of America. Carton with internal partition. 4,413,769., Cl. 229-27.000.

Micropump Corporation: *See*—
Pieters, Ferdinandus A., 4,414,523., Cl. 335-302.000.

Middlemiss, William S. Antique lawn pump mobile. 4,413,778., Cl. 239-17.000.

Midland-Ross Corporation: *See*—
DeCoste, Stephen H., 4,414,440., Cl. 200-50.00B.

Midorikawa, Norio: *See*—
Murakami, Keiichi; Amemiya, Shinichi; Miyazaki, Junji; Yanashima, Tadahiko; Iida, Atsuo; Shimura, Takaki; Miwa, Hirohide; and Midorikawa, Norio, 4,413,520., Cl. 73-609.000.

Midwestco, Inc.: *See*—
Moyer, James D.; and Hoffert, Robert S., 4,413,580., Cl. 112-262.200.

Mihara, Yuji: *See*—
Masuda, Nobuhito; Mihara, Yuji; Okazaki, Masaki; and Makiuchi, Hajime, 4,414,325., Cl. 435-7.000.

Miki, Yukio; and Egawa, Takeshi, to Minolta Camera Kabushiki Kaisha. Interchangeable lens and camera for use therewith. 4,413,894., Cl. 354-195.000.

Mikoshiba, Hitoshi: *See*—
Suzuki, Kazutomi; Mikoshiba, Hitoshi; and Mitani, Yuji, 4,413,877., Cl. 350-1.700.

Mikura, Chihoto: *See*—
Shibata, Fujio; Hirabayashi, Kenji; and Mikura, Chihoto, 4,414,289., Cl. 428-695.000.

Milh, Alfred-Henri. Prefabricated frame and a multi-storey building including said frame. 4,413,454., Cl. 52-236.600.

Milkovic, Miran, to General Electric Company. Low cost sensing system and method employing anistropic magneto-resistive ferrite member. 4,414,510., Cl. 324-252.000.

Miller, Christopher F., to Burroughs Corporation. System condition selection circuitry. 4,414,625., Cl. 364-200.000.

Miller, Collier M.: *See*—
Matthias, Dan W.; and Miller, Collier M., 4,413,920., Cl. 400-248.000.

Miller, Gardner H., to Trustroke International, Inc. Golf training aid. 4,413,826., Cl. 273-186.00C.

Miller, George A.; and Chan, Hak-Foon, to Rohm and Haas Company. 2-Hydroxyarylethyltriazole fungicides. 4,414,210., Cl. 424-245.000.

Miller, Joseph S.; and Aylor, Ronald L., to Atlanta Felt Company, Inc. Press felt. 4,414,263., Cl. 428-234.000.

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Miller, Raimund; and Tenud, Leander, to Lonza Ltd. Process for the production of tetronic acid. 4,414,400., Cl. 549-313.000.

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Miller, William R.; and Howell, Jones V., to Archive Corporation. Streaming cartridge tape drive. 4,414,593., Cl. 360-102.000.

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Milligan, Brian; Buechler, Peter R.; and Feairheller, Stephen H., to United States of America, Agriculture. Dicarbamoylsulfonate tanning agent. 4,413,997., Cl. 8-94.210.

Millmaster Onyx Group, Inc.: *See*—
Rosato, Dennis W.; and Lister, Neil K., 4,414,265., Cl. 428-285.000.

Mills, Walter H.; and Bilbrey, Joseph T., Sr., to Wallace Murray Corporation. Fluid-release mold and the method of manufacturing the same. 4,413,966., Cl. 425-84.000.

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Mineo, Yoshiharu: *See*—
Sasaki, Hiroaki; Inoue, Testuya; Mineo, Yoshiharu; Iguchi, Sei; Makita, Kazuhide; Arai, Hiroshi; Itoh, Hajime; Ohta, Hisatoshi; Inazu, Masahiro; and Kawahashi, Akira, 4,413,424., Cl. 33-361.000.

Miner, Carla J.: *See*—
Baraff, David R.; Serinken, Nur M.; Streater, Richard W.; Miner, Carla J.; Boynton, Robert J.; MacLaurin, Blair K.; and Westwood, William D., 4,413,883., Cl. 350-334.000.

Mingret, Jean: *See*—
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Minnesota Mining and Manufacturing Co.: *See*—
Mosier, Douglas R., 4,414,602., Cl. 361-190.000.
Pokorny, Richard J., 4,414,355., Cl. 524-462.000.
Reisem, Daniel E., 4,414,521., Cl. 335-281.000.
Siedle, Allen R., 4,414,376., Cl. 528-15.000.

Minolta Camera Kabushiki Kaisha: *See*—
Miki, Yukio; and Egawa, Takeshi, 4,413,894., Cl. 354-195.000.

Missaire, Gerhard: *See*—
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Mita Industrial Co. Ltd.: *See*—
Miyakawa, Nobuhiro; Fujii, Masanori; and Maekawa, Kouzi, 4,414,321., Cl. 430-106.600.
Miyakawa, Nobuhiro; Fujii, Masanori; and Maekawa, Kouzi, 4,414,322., Cl. 430-106.600.

Mitani, Yuji: *See*—
Suzuki, Kazutomi; Mikoshiba, Hitoshi; and Mitani, Yuji, 4,413,877., Cl. 350-1.700.

Mitsubishi Chemical Industries Limited: *See*—
Koyama, Hiroaki; and Shimizu, Shigeo, 4,414,378., Cl. 528-137.000.
Koyama, Hiroaki; and Shimizu, Shigeo, 4,414,379., Cl. 528-137.000.
Otake, Masayuki; Hatano, Masakatsu; Koyama, Toru; Murayama, Masayoshi; and Oshima, Kazunori, 4,414,133., Cl. 502-179.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Haraga, Kousuke; and Hattori, Katsutoshi, 4,414,257., Cl. 428-182.000.
Hirata, Seiichiro, 4,414,687., Cl. 455-165.000.
Nishimura, Tadashi; and Mashiko, Yoji, 4,414,242., Cl. 427-43.100.

Mitsubishi Petrochemical Co. Ltd.: *See*—
Nojiri, Naohiro; and Sakai, Yukio, 4,414,135., Cl. 502-224.000.

Mitsubishi Plastics Industries Limited: *See*—
Nanbu, Kazuhiko, 4,414,261., Cl. 428-213.000.

Mittleman, Herbert, to Baxter Travenol Laboratories, Inc. Air bypass valve assembly for a medical fluid administration set. 4,413,990., Cl. 604-122.000.

Miura, Yosinari: *See*—
Sasaki, Takesada; Endo, Hiroshi; Zama, Yoshimasa; Shiraishi, Masahiko; Miura, Yosinari; and Yamaguchi, Masayuki, 4,413,657., Cl. 138-149.000.

Miwa, Hirohide: *See*—
Murakami, Keiichi; Amemiya, Shinichi; Miyazaki, Junji; Yanashima, Tadahiko; Iida, Atsuo; Shimura, Takaki; Miwa, Hirohide; and Midorikawa, Norio, 4,413,520., Cl. 73-609.000.

Miyajiri, Tetsuo: *See*—
Edahiro, Takao; Miyajiri, Tetsuo; Yokota, Hiroshi; and Kuwahara, Toru, 4,414,008., Cl. 65-3.120.

Miyakawa, Nobuhiro; Fujii, Masanori; and Maekawa, Kouzi, to Mita Industrial Co. Ltd. Dry composite blended magnetic developer of resin encapsulated fine magnetite and resin encapsulated coarse magnetite. 4,414,321., Cl. 430-106.600.

Miyakawa, Nobuhiro; Fujii, Masanori; and Maekawa, Kouzi, to Mita Industrial Co. Ltd. Two-component type magnetic developer. 4,414,322., Cl. 430-106.600.

Miyamoto, Kiyoshi: *See*—
Ueda, Kenji; and Miyamoto, Kiyoshi, 4,414,478., Cl. 307-116.000.

Miyano, Kenjiro: *See*—
Abraham, Bernard M.; Miyano, Kenjiro; and Ketterson, John B., 4,413,506., Cl. 73-64.400.

Miyasaka, Masao: *See*—
Monma, Hisayoshi; Miyasaka, Masao; and Kubo, Kazuyuki, 4,413,558., Cl. 101-93.140.

Miyashita, Teruo: *See*—
Yoshida, Kohichi; Miyashita, Teruo; Oka, Yasuo; and Kajiyama, Takashi, 4,414,077., Cl. 204-35.00N.

Miyata Industry Co., Ltd.: *See*—
Matsutani, Yoshihide, 4,413,746., Cl. 220-89.00A.

Miyauchi, Hirotsugu: *See*—
Kimoto, Kyoji; and Miyauchi, Hirotsugu, 4,414,338., Cl. 521-27.000.

Miyazaki, Junji: *See*—
Murakami, Keiichi; Amemiya, Shinichi; Miyazaki, Junji; Yanashima, Tadahiko; Iida, Atsuo; Shimura, Takaki; Miwa, Hirohide; and Midorikawa, Norio, 4,413,520., Cl. 73-609.000.

Miyazawa, Kokichi; Nakata, Kazuo; Ishikawa, Tsuneo; Honma, Ichiro; Koyama, Arata; and Amano, Masatoshi, to Ishihara Sangyo Kaisha, Ltd. Process for producing cobalt containing ferromagnetic iron oxides. 4,414,245., Cl. 427-127.000.

Miyazawa, Tatsushi: *See*—
Tsuchimoto, Takamitsu; Kaneda, Saburo; Miyazawa, Tatsushi; Shimada, Toshio; Suzuki, Hideo; Sanagai, Mitsuru; and Hiraoka, Kaoru, 4,414,620., Cl. 364-200.000.

Miyoshi, Mituji: *See*—
Kuroda, Nobuyuki; Horie, Tatsuo; Matsuura, Kazuo; Kubo, Kunimichi; and Miyoshi, Mituji, 4,414,369., Cl. 526-65.000.

Miyoshi, Takahito; Okutu, Toshimitu; Akashi, Goro; Kitamoto, Tatsuji; and Fujiyama, Masaaki, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,414,270., Cl. 428-325.000.

Miyoshi, Toshio: *See*—
Imanaka, Hiroshi; Miyoshi, Toshio; Konomi, Toshio; Kubochi, Yoshiaki; Hattori, Seiziro; and Kawakita, Takeshi, 4,414,328., Cl. 435-47.000.

Mizoguchi, Tetsuhiko; and Koyama, Akio, to Tokyo Shibaura Denki Kabushiki Kaisha. Gas-insulated bus bar. 4,414,424., Cl. 174-28.000.

Mizuno, Kenji: *See*—
Watanabe, Tomoyoshi; Hirayama, Takanobu; Yoshimura, Motokazu; Mizuno, Kenji; and Inukai, Yukio, 4,414,496., Cl. 318-696.000.

Mizuno, Kohtaro: *See*—
Okamoto, Eisaku; and Mizuno, Kohtaro, 4,413,545., Cl. 84-1.280.

Mizushima, Yoshihiko: *See*—
Amemiya, Yoshihito; Urisu, Tsuneo; and Mizushima, Yoshihiko, 4,414,557., Cl. 357-16.000.

Mobay Chemical Corporation: *See*—
Burge, Russell W., 4,413,540., Cl. 82-47.000.

Mobil Oil Corporation: *See*—
Chester, Arthur W.; and Garwood, William E., 4,414,097., Cl. 208-59.000.
Godbey, John K., 4,413,511., Cl. 73-155.000.
Kokotailo, George T.; Rohrman, Albert C., Jr.; and Sawruk, Stephen, 4,414,189., Cl. 423-328.000.
Rankel, Lillian A.; and Rudnick, Leslie R., 4,414,102., Cl. 208-211.000.
Tobias, Michael A., 4,414,283., Cl. 428-461.000.
Zemanek, Joseph, Jr., 4,413,512., Cl. 73-152.000.

Moeller, Guenther, executor: *See*—
Roth, Anton, deceased; and Moeller, Guenther, executor, 4,413,942., Cl. 414-253.000.

Mohn, Hans-Werner: *See*—
Buchholz, Rainer; Tomashauser, Josef; Zodrow, Rudolf; and Mohn, Hans-Werner, 4,414,056., Cl. 156-476.000.

Mohr, Hans G.: *See*—
Tomoff, Toma; Mohr, Hans G.; and Kempf, Volker, 4,413,534., Cl. 73-864.210.

Molin, Marc: *See*—
Aubouy, Michel; Hamel, Pierre; and Molin, Marc, 4,414,415., Cl. 564-412.000.

Moll, Rudolf; Ragaller, Klaus; and Schade, Ekkehard, to BBC Brown, Boveri & Company, Limited. High voltage power switch. 4,414,450., Cl. 200-147.00R.

Molle, Jean-Francois: *See*—
Lucas, Jean; Molle, Jean-Francois; Gille, Etienne; and Creze, Patrick, 4,414,002., Cl. 48-209.000.

Mollgaard, Klaus: *See*—
Gast, Uwe; Jung, Eggert; Kuhn, Franz; Mollgaard, Klaus; Redecker, Friedrich; Sendtko, Ulrich; Sommer, Rudiger; Wellendorf, Klaus; and Knop, Hans-Georg, 4,414,635., Cl. 364-526.000.

Molloy, James J.: *See*—
Applegate, Steven L.; and Molloy, James J., 4,413,919., Cl. 400-208.000.

Mondini, Giancarlo: *See*—
Mandl, Gerhard; Mondini, Giancarlo; Pietrini, Viktor; Weber, Kurt; and Wildbolz, Rudolf, 4,413,378., Cl. 19-258.000.

Monma, Hisayoshi; Miyasaka, Masao; and Kubo, Kazuyuki, to Hitachi Koki Co., Ltd. Line printer and type carrier for use therein. 4,413,558., Cl. 101-93.140.

Monsanto Company: *See*—
Coran, Aubert Y.; and Goettler, Lloyd A., 4,414,267., Cl. 428-288.000.
Slocombe, Robert J., 4,414,354., Cl. 524-460.000.

Montedison S.p.A.: *See*—
Colle, Roberto; Gozzo, Franco; and Preziuso, Ciro, 4,414,018., Cl. 71-88.000.
DeAlberti, Giordano; Covini, Romano; Padovan, Mario; Battiston, Giancarlo; and Petrini, Guido, 4,414,412., Cl. 562-535.000.
Mestroni, Giovanni; Zassinovich, Grazia; and Camus, Annamaria, 4,414,417., Cl. 568-315.000.

Moore, George G. I., to Riker Laboratories, Inc. 3,5-Di(t-butyl)-4-hydroxyphenyl substituted pyridines. 4,414,217., Cl. 424-263.000.

Moore, Richard L.: *See*—
Timberlake, John R.; Ruzic, David N.; Moore, Richard L.; Cohen, Samuel A.; and Manos, Dennis M., 4,414,244., Cl. 427-105.000.

Moran, David P. J.; and Hepburn, John J, to Lever Brothers Company. Edible emulsions containing gelling agents. 4,414,236., Cl. 426-573.000.

Morgan Construction Company: *See*—
Gilvar, Martin; and Wykes, Philips, 4,413,494., Cl. 72-167.000.

Morishita, Michio: *See*—
Ii, Akira; Sasano, Mitunori; Morishita, Michio; Kuno, Mikio; and Kadowaki, Kunio, 4,414,162., Cl. 261-23.00A.

Morris, John C.; and Jackson, Winston J., Jr., to Eastman Kodak Company. Copolyesters derived from 2,6-naphthalenedicarboxylic acid, trans-4,4'-stilbenedicarboxylic acid and ethylene glycol. 4,414,382., Cl. 528-298.000.

Morrison, Howard J.: *See*—
Kulesza, Ralph J.; and Morrison, Howard J., 4,413,443., Cl. 46-206.000.

Morrone, John J.; and Morrone, Mary J. Chip dispenser. 4,413,750., Cl. 221-263.000.

Morrone, Mary J.: *See*—
Morrone, John J.; and Morrone, Mary J., 4,413,750., Cl. 221-263.000.

Morrow, Alan J.: *See*—
Bailey, Alan C.; and Morrow, Alan J., 4,413,882., Cl. 350-96.300.

Morse, Henry C. Carton-slide chart. 4,413,730., Cl. 206-232.000.

Moscrip, William M. Heat transfer components for Stirling-cycle, reciprocating thermal machines. 4,413,473., Cl. 60-517.000.

Moscrip, William M. Mechanical arrangements for Stirling-cycle, reciprocating thermal machines. 4,413,474., Cl. 60-517.000.

Moscrip, William M. Thermodynamic working fluids for Stirling-cycle, reciprocating thermal machines. 4,413,475., Cl. 60-521.000.

Mosebach, Wilhelm: *See*—
Breidenbach, Dieter; and Mosebach, Wilhelm, 4,414,072., Cl. 202-248.000.

Mosebrook, Dennis R.; and Seeley, Wayne C., to Dentsply Research & Development Corp. Multi-unit storage cabinet. 4,413,867., Cl. 312-111.000.

Moser, Winfried; Muller, Klaus; and Rieger, Franz, to Robert Bosch GmbH. Combustion process parameter sensor. 4,413,509., Cl. 73-117.300.

Mosier, Douglas R., to Minnesota Mining and Manufacturing Co. Current director and interface circuit for a transformer relay. 4,414,602., Cl. 361-190.000.

Motoren-und Turbinen-Union Munchen GmbH: *See*—
Thoma, Martin, 4,414,039., Cl. 148-6.200.

Motorola, Inc.: *See*—
Comroe, Richard A., 4,414,675., Cl. 375-90.000.
Davis, Walter L.; and Jacobson, James E., Jr., 4,414,623., Cl. 364-200.000.
Kennedy, Howard L., 4,414,504., Cl. 324-78.00R.
Kraul, Douglas R.; and Marshall, James W., 4,414,676., Cl. 375-116.000.
Nelson, Robert N., 4,414,512., Cl. 328-151.000.
Williamson, Thomas R., III; Jones, Beth B.; Field, Harold; and Stephenson, Robert F., 4,414,303., Cl. 429-217.000.

Moyer, James D.; and Hoffert, Robert S., to Midwestco, Inc. Method for forming fabric tubes. 4,413,580., Cl. 112-262.200.

Mueller, Wolfgang, to Siemens Aktiengesellschaft. Method for producing dynamic semiconductor memory cells with random access (RAM) by double polysilicon gate technology. 4,414,058., Cl. 156-643.000.

Mukai, Takamitsu: *See*—
Kato, Kimio; Kobayashi, Hisao; Mukai, Takamitsu; Kono, Hiroya; and Yamamoto, Taku, 4,413,955., Cl. 417-270.000.

Mulcahy, Harry W., to AMSTED Industries Incorporated. Steering railroad truck. 4,413,569., Cl. 105-168.000.

Muller, Dan E.: *See*—
Engelbert, Carrol D.; Muller, Larry M.; and Muller, Dan E., 4,413,785., Cl. 239-443.000.

Muller, Klaus: *See*—
Moser, Winfried; Muller, Klaus; and Rieger, Franz, 4,413,509., Cl. 73-117.300.

Muller, Larry M.: *See*—
Engelbert, Carrol D.; Muller, Larry M.; and Muller, Dan E., 4,413,785., Cl. 239-443.000.

Muller, Werner: *See*—
Dausinger, Friedrich; Muller, Werner; and Arnold, Peter, 4,414,038., Cl. 148-4.000.

Murakami, Keiichi; Amemiya, Shinichi; Miyazaki, Junji; Yanashima, Tadahiko; Iida, Atsuo; Shimura, Takaki; Miwa, Hirohide; and Midorikawa, Norio, to Fujitsu Limited. Ultrasonic imaging apparatus. 4,413,520., Cl. 73-609.000.

Murakami, Takeshi: *See*—
Tsuchiya, Hiroshi; Yamahira, Hitoshi; and Murakami, Takeshi, 4,414,259., Cl. 428-207.000.

Murase, Kiyoshi: *See*—
Iwanami, Masaru; Maeda, Tetsuya; Nagano, Yoshinobu; Fujimoto, Masaharu; Nagano, Noriaki; Yamazaki, Atsuki; Tamazawa, Kazaharu; Murase, Kiyoshi; and Shibanuma, Tadao, 4,414,153., Cl. 260-239.100.

Murayama, Masayoshi: *See*—
Otake, Masayuki; Hatano, Masakatsu; Koyama, Toru; Murayama, Masayoshi; and Oshima, Kazunori, 4,414,133., Cl. 502-179.000.

Murne, Bertil S. O.: *See*—
Larsson, Lars-Goran; and Murne, Bertil S. O., 4,413,464., Cl. 53-412.000.

Murphey, Joseph R., to Halliburton Company. Method and compositions for dissolving silicates in subterranean formation. 4,414,118., Cl. 252-8.55C.

Murphy, John H.; Packer, Jon D.; and Brown, Dennis R., to Kolmar Laboratories, Inc. Powder stick composition for topical application. 4,414,200., Cl. 424-63.000.

Murrell, Robert A. Automatic monitoring system for radio signal. 4,414,632., Cl. 364-487.000.

Musser, John J., to George P. Reintjes Company, Inc. Adjustable support assembly for open hearth furnace. 4,413,572., Cl. 110-331.000.

Myer, John H., to Hughes Aircraft Company. Tool for forming precisely curved surfaces. 4,413,500., Cl. 72-465.000.

Myer, Jon H., to Hughes Aircraft Company. Ophthalmic clip. 4,413,635., Cl. 128-782.000.

Nagano, Noriaki: *See*—
Iwanami, Masaru; Maeda, Tetsuya; Nagano, Yoshinobu; Fujimoto, Masaharu; Nagano, Noriaki; Yamazaki, Atsuki; Tamazawa, Kazaharu; Murase, Kiyoshi; and Shibanuma, Tadao, 4,414,153., Cl. 260-239.100.

Nagano, Yoshinobu: *See*—
Iwanami, Masaru; Maeda, Tetsuya; Nagano, Yoshinobu; Fujimoto, Masaharu; Nagano, Noriaki; Yamazaki, Atsuki; Tamazawa, Kazaharu; Murase, Kiyoshi; and Shibanuma, Tadao, 4,414,153., Cl. 260-239.100.

Nagashima, Takashi, to Aisin Seiki Kabushiki Kaisha. Fluid pressure control valve unit of the inertia-controlled type. 4,413,861., Cl. 303-6.00C.

Nagl, Martin: *See*—
Pirklbauer, Wilfried; and Nagl, Martin, 4,413,812., Cl. 266-195.000.

Nair, Vijay G.; and Bernstein, Seymour, to American Cyanamid Company. Rutin poly(H-)sulfate salts and related compounds. 4,414,207., Cl. 424-180.000.

Naito, Yukio: *See*—
Shiga, Akinobu; Matsuyama, Kiyoshi; Kakugo, Masahiro; Naito, Yukio; Ima, Seiichiro; and Yamashita, Katsuyoshi, 4,414,373., Cl. 526-348.000.

Nakagawa, Kazuyuki: *See*—
Tominaga, Michiaki; Yung-hsiung, Yang; Ogawa, Hidenori; and Nakagawa, Kazuyuki, 4,414,390., Cl. 546-121.000.

Nakahara, Motohiro: *See*—
Suto, Shoichi; Suda, Hiroyuki; Hanawa, Fumiaki; Nakahara, Motohiro; and Inagaki, Nobuo, 4,414,012., Cl. 65-18.200.

Nakajima, Kunio: *See*—
Iwata, Toyotaro; Nakajima, Kunio; and Otsuki, Hiroyuki, 4,414,073., Cl. 204-299.00R.

Nakamichi Corporation: *See*—
Nakamichi, Niro, 4,414,596., Cl. 360-129.000.

Nakamichi, Niro, to Nakamichi Corporation. Magnetic head assembly. 4,414,596., Cl. 360-129.000.

Nakamura, Kazuharu; Matsumoto, Motoki; Tsuboi, Yoshimasa; Kondo, Akinobu; and Kataoka, Yoshitaka, to Toyotomi Kogyo Co., Ltd. Red-hot type oil burner. 4,413,612., Cl. 126-92.00C.

Nakamura, Koichi; and Hirai, Hiroyuki, to Fuji Photo Film Co., Ltd. Image-forming method. 4,414,305., Cl. 430-373.000.

Nakamura, Teruo, to Nippon Electric Co., Ltd. Main memory control system. 4,414,627., Cl. 364-200.000.

Nakaoka, Hideo, to Ricoh Company, Ltd. Pupil divisional focusing position detection apparatus using lenticula lens. 4,414,470., Cl. 250-204.000.

Nakata, Kazuo: *See*—
Miyazawa, Kokichi; Nakata, Kazuo; Ishikawa, Tsuneo; Honma, Ichiro; Koyama, Arata; and Amano, Masatoshi, 4,414,245., Cl. 427-127.000.

Nakatsui, Hisashi: *See*—
Kato, Yuzo; Ishihara, Shunichi; Sato, Yasushi; Tanaka, Nobuyoshi; Kawamura, Naoto; and Nakatsui, Hisashi, 4,414,581., Cl. 358-280.000.

Nakauchi, Yuji: *See*—
Washida, Akira; and Nakauchi, Yuji, 4,413,831., Cl. 277-40.000.

Nalco Chemical: *See*—
Rende, Dominic S., 4,414,060., Cl. 162-36.000.

Nanbu, Kazuhiko, to Mitsubishi Plastics Industries Limited. Adhesive tape. 4,414,261., Cl. 428-213.000.

Narisawa, Ryo: *See*—
Inoue, Kazuo; Narisawa, Ryo; Wada, Ryuji; Sato, Toshihiko; and Irino, Hiroshi, 4,413,602., Cl. 123-486.000.

Narumi, Naoaki: *See*—
Kimura, Kenji; Sugamori, Shigeru; Ishikawa, Kohji; and Narumi, Naoaki, 4,414,665., Cl. 371-21.000.

Nati, Salvatore F., Jr.: *See*—
Bedard, James F.; Eichelberger, Charles W.; and Nati, Salvatore F., Jr., 4,414,501., Cl. 323-280.000.

National Machine Company, Inc.: *See*—
Seabase, Peter P.; and Crewes, Rickard N., 4,413,645., Cl. 137-223.000.

National Research Development Corporation: *See*—
Gerzon, Michael A., 4,414,430., Cl. 381-22.000.
Marchbanks, Robert J., 4,413,634., Cl. 128-746.000.

National Semiconductor Corporation: *See*—
Burns, Carmen D., 4,413,404., Cl. 29-590.000.
Klein, Thomas; Varadi, Andrew G.; and Boettcher, Charles E., 4,413,401., Cl. 29-571.000.
Nelson, Robert D., 4,414,666., Cl. 371-37.000.

National Slag Limited: *See*—
Orlander, Michael; Cotsworth, Robert P.; and MacKenzie, Peter A., 4,414,016., Cl. 65-141.000.

Naylor, Graham J., to Naylor, Graham J.; and Naylor, Pamela H. Method of treatment of pre-menstrual syndrome. 4,414,212., Cl. 424-247.000.

Naylor, Pamela H.: *See*—
Naylor, Graham J., 4,414,212., Cl. 424-247.000.

Nazarian, Miron M.: *See*—
Axenko, Alexandr A.; Nazarian, Miron M.; Kolyada, Vladimir A.; Mataev, Arkady R.; and Shamsha, Ljudmila F., 4,414,091., Cl. 204-277.000.

NDT Instruments, Inc.: *See*—
Jones, Robert L., 4,413,518., Cl. 73-615.000.

Neary, Michael P.; and Wilson, Thomas A. Process for cracking hydrocarbons. 4,414,082., Cl. 204-162.00R.

Neefe, Russell A. Oxygen permeable contact lens material comprising copolymers of multifunctional siloxanyl alkylesters. 4,414,375., Cl. 526-260.000.

Nelson, David L.: *See*—
Oliver, Theodore A.; Nelson, David L.; and Chan, Keat-Lye, 4,414,589., Cl. 360-77.000.

Nelson, Robert D., to National Semiconductor Corporation. Error checking and correcting apparatus. 4,414,666., Cl. 371-37.000.

Nelson, Robert N., to Motorola Inc. Broadband peak detector. 4,414,512., Cl. 328-151.000.

Nestler, Hans J.: *See*—
Heier, Karl H.; Nestler, Hans J.; Bieringer, Hermann; and Bauer, Klaus, 4,414,020., Cl. 71-108.000.

Netravali, Arun N.: *See*—
Johnsen, Ottar; and Netravali, Arun N., 4,414,580., Cl. 358-260.000.

Nettleton, James S., to Polysar Limited. Rubber recovery apparatus. 4,413,971., Cl. 425-311.000.

Neumaier, Heinrich: *See*—
Bleidt, Rolf; and Neumaier, Heinrich, 4,414,451., Cl. 200-148.00H.

New York Envelope Corp.: *See*—
Alter, Seymour S., 4,413,984., Cl. 493-222.000.

Newberry, Michael E.; and Barker, Kenneth M., to Petrolite Corporation. Method for the removal of asphaltenic deposits. 4,414,035., Cl. 134-3.000.

Newcombe, Elliott H., Jr., to Atlantic Coast Carton Company. Multiple component film package. 4,413,734., Cl. 206-455.000.

Newman, Harold C.; and Stoll, William M., to Kennametal Inc. Powder mixtures for wear resistant facings and products produced therefrom. 4,414,029., Cl. 75-252.000.

Newsome, Thomas B.; and Fulford, Garry, to Laycock Engineering Limited. Friction clutches. 4,413,716., Cl. 192-70.120.

Newton, Stephen J.; and Patel, Abdul H., to Thorn Domestic Appliances (Electrical) Ltd. Cooking apparatus. 4,414,465., Cl. 219-449.000.

NGK Spark Plug Co., Ltd.: *See*—
Nishio, Kanemitsu; Takagi, Shunichi; and Suzuki, Yasuhiko, 4,414,483., Cl. 313-136.000.

N'Guyen Duc, Xuong; and Szabo, Rene, to Coflexip. Swivel connector between a floating or semi-submerged structure and a riser or flow line. 4,413,844., Cl. 285-16.000.

Nguyen, Tinh: *See*—
Gaul, James M.; and Nguyen, Tinh, 4,414,361., Cl. 524-702.000.

Nibling, Jerre L. Jewelry box. 4,413,736., Cl. 206-566.000.

Nicholas, Karl W.: *See*—
Waits, Charles G.; Nicholas, Karl W.; and Bushman, James B., 4,414,511., Cl. 324-347.000.

Nicholas, Richard W.: *See*—
McMahan, David R.; and Nicholas, Richard W., 4,414,614., Cl. 362-269.000.

Nield, Eric; and Thompson, Martin K., to Imperial Chemical Industries PLC. Filled compositions of thermoplastic polyamide and polyester. 4,414,358., Cl. 524-538.000.

Nielsen, Anker J., Jr., to Omco Inc. Front entry locking ring assembly. 4,413,490., Cl. 70-164.000.

Nihon Plast Co., Ltd.: *See*—
Sano, Yoshiaki, 4,414,170., Cl. 264-242.000.

Nihon Repromachine Kogyo Kabushiki Kaisha: *See*—
Kinoshita, Tomoo; and Hinuma, Minoru, 4,413,965., Cl. 425-71.000.

Ninet, Jean-Louis, to Societe Anonyme dite: Ateliers et Chantiers de Bretagne-ACB. System and method for positioning an off-shore platform on a support. 4,413,926., Cl. 405-204.000.

Ninomiya, Yoshito: *See*—
Sekido, Satoshi; Ninomiya, Yoshito; and Yamazaki, Yoshihiro, 4,414,607., Cl. 361-433.000.

Nippon Electric Co., Ltd.: *See*—
Matsumoto, Keiji, 4,414,622., Cl. 364-200.000.
Nakamura, Teruo, 4,414,627., Cl. 364-200.000.
Tokuda, Kazuo; and Sawataishi, Tokio, 4,414,569., Cl. 358-153.000.
Tsutaki, Kunio; and Kageyama, Takao, 4,414,486., Cl. 315-3.600.

Nippon Electric Industry Co., Ltd.: *See*—
Sasaki, Ryoichi, 4,413,373., Cl. 16-54.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Okamoto, Eisaku; and Mizuno, Kohtaro, 4,413,545., Cl. 84-1.280.

Nippon Kogaku K.K.: *See*—
Ogasawara, Akira, 4,414,469., Cl. 250-201.000.

Nippon Kokan Kabushiki Kaisha: *See*—
Fukushima, Tsutomu; Kawasaki, Kiyoshi; and Sasaki, Sadayuki, 4,414,026., Cl. 75-130.500.

Nippon Light Metal Company Limited: *See*—
Yoshida, Kohichi; Miyashita, Teruo; Oka, Yasuo; and Kajiyama, Takashi, 4,414,077., Cl. 204-35.00N.

Nippon Oil Company, Limited: *See*—
Kuroda, Nobuyuki; Horie, Tatsuo; Matsuura, Kazuo; Kubo, Kunimichi; and Miyoshi, Mituji, 4,414,369., Cl. 526-65.000.

Nippon Oil and Fats, Co., Ltd.: *See*—
Takeuchi, Fumio; and Takahashi, Masao, 4,414,044., Cl. 149-2.000.

Nippon Piston Ring Co., Ltd.: *See*—
Ebihara, Tadashi, 4,414,284., Cl. 428-550.000.

Nippon Soken, Inc.: *See*—
Ohta, Minoru; Hattori, Yutaka; Kawakami, Tomio; and Onoda, Michitoshi, 4,413,502., Cl. 73-23.000.

Nippon Steel Corporation: *See*—
Sasaki, Takesada; Endo, Hiroshi; Zama, Yoshimasa; Shiraishi, Masahiko; Miura, Yosinari; and Yamaguchi, Masayuki, 4,413,657., Cl. 138-149.000.

Nippon Telegraph & Telephone Public Corporation: *See*—
Amemiya, Yoshi[illegible]; Urisu, Tsuneo; and Mizushima, Yoshihiko, 4,414,557., Cl. 357-16.000.
Edahiro, Takao; Miyajiri, Tetsuo; Yokota, Hiroshi; and Kuwahara, Toru, 4,414,008., Cl. 65-3.120.
Kimura, Kenji; Sugamori, Shigeru; Ishikawa, Kohji; and Narumi, Naoaki, 4,414,665., Cl. 371-21.000.

Suto, Shoichi; Suda, Hiroyuki; Hanawa, Fumiaki; Nakahara, Motohiro; and Inagaki, Nobuo, 4,414,012., Cl. 65-18.200.

Nippon Zeon Co. Ltd.: *See—*
Akita, Shuichi; Chida, Takeshi; Watanabe, Hiroyuki; and Ueda, Akio, 4,414,363., Cl. 525-237.000.

Nippondenso Co., Ltd.: *See—*
Sasaki, Hiroaki; Inoue, Testuya; Mineo, Yoshiharu; Iguchi, Sei; Makita, Kazuhide; Arai, Hiroshi; Itoh, Hajime; Ohta, Hisatoshi; Inazu, Masahiro; and Kawahashi, Akira, 4,413,424., Cl. 33-361.000.
Sugiura, Junzi; Okada, Hiroshi; Hayashi, Michitaka; Yamazaki, Toru; and Sugimoto, Hiroshi, 4,413,527., Cl. 73-754.000.

Nishida, Katsutoshi: *See—*
Seimiya, Motoo; and Nishida, Katsutoshi, 4,414,190., Cl. 423-344.000.

Nishihara, Toshio: *See—*
Iwata, Kaoru; Nishihara, Toshio; Ohe, Michisuke; Saito, Yoichi; and Horike, Akihiro, 4,414,254., Cl. 428-34.000.

Nishimura, Tadashi; and Mashiko, Yoji, to Mitsubishi Denki Kabushiki Kaisha. Process for fabricating a semiconductor device. 4,414,242., Cl. 427-43.100.

Nishio, Kanemitsu; Takagi, Shunichi; and Suzuki, Yasuhiko, to NGK Spark Plug Co., Ltd. Spark plug and manufacturing process thereof. 4,414,483., Cl. 313-136.000.

Nishizawa, Jun-ichi; and Teshima, Toru, to Zaidan Hojin Handotai Kenkyu Shinkokai; and Stanley Electric Co., Ltd. Hetero-junction light-emitting diode. 4,414,558., Cl. 357-17.000.

Nishizawa, Masahiko; and Fujimura, Takashi, to Hitachi, Ltd. Method of exposing to light fluorescent screens of color picture tubes. 4,414,318., Cl. 430-24.000.

Nissan Design International, Inc.: *See—*
Hirshberg, Gerald P., 4,413,854., Cl. 296-146.000.

Nissan Motor Company, Limited: *See—*
Chikaraishi, Takayo, 4,413,444., Cl. 49-409.000.
Hayashi, Kazuo, 4,413,857., Cl. 297-180.000.
Hirota, Toshio, 4,413,594., Cl. 123-3.000.
Kawamura, Yoshihisa; and Yasuhara, Seishi, 4,413,508., Cl. 73-116.000.
Matsuoka, Hideoki; and Kondoh, Yoshinobu, 4,413,841., Cl. 280-802.000.
Seki, Nakanobu, 4,413,947., Cl. 415-182.000.
Tamura, Takeo; and Imai, Mamoru, 4,413,798., Cl. 248-27.100.
Tsutsumi, Saburo, 4,413,598., Cl. 123-306.000.

Nitto Boseki Co., Ltd.: *See—*
Kawaguchi, Yutaka; Sato, Michio; and Kasai, Shin, 4,413,791., Cl. 242-18.00G.

Nitto Chemical Industry Co., Ltd.: *See—*
Watanabe, Ichiro; Satoh, Yoshiaki; and Yamaguchi, Yasumasa, 4,414,331., Cl. 435-129.000.

Nitto Electric Industrial Co., Ltd.: *See—*
Iwama, Akio; and Kazuse, Yoshitaka, 4,414,157., Cl. 260-428.500.

Niwiera, Wolfgang; Holtorf, Franz-Josef; and Biederer, Hans H., to Kabel-und Metallwerke, Guthehoffnungshutte AG. Method of making a multi-bore element. 4,413,768., Cl. 228-173.00A.

NL Industries, Inc.: *See—*
Page, Enno H., 4,413,666., Cl. 164-72.000.

Nojiri, Naohiro; and Sakai, Yukio, to Mitsubishi Petrochemical Co. Ltd. Silver-based catalyst containing bromine and/or fluorine as an anionic component for the production of ethylene oxide. 4,414,135., Cl. 502-224.000.

Nolan, John J., to Allis-Chalmers Corporation. Self back-flushing magnetic separator process. 4,414,116., Cl. 210-695.000.

Nolf, Jean M. E., to N.V. Raychem S.A. Branch-off seal. 4,413,922., Cl. 403-341.000.

Nomura, Yoshiyuki; and Okuda, Kanemasa, to Fujitsu Fanuc Ltd. Wire-cut, electric discharge machine. 4,414,457., Cl. 219-69.00W.

Nomura, Yoshiyuki, to Fujitsu Limited. Wire-cut, electric discharge machine. 4,414,458., Cl. 219-69.00W.

Nordholt, Ernst H.; and Van Willigen, Durk, to U.S. Philips Corporation. Active aerial. 4,414,690., Cl. 455-283.000.

Nordson Corporation: *See—*
Kolibas, James A., 4,414,248., Cl. 427-236.000.

Norman, Robert D., to Spar Aerospace Limited. Universal service tool. 4,413,538., Cl. 81-57.130.

Norota, Susumu: *See—*
Kiriyama, Tsutomu; Norota, Susumu; Segawa, Yasuhiko; Emi, Shingo; Imoto, Tadasi; and Azumi, Toshinori, 4,414,276., Cl. 428-374.000.

North American Philips Corporation: *See—*
Liebert, Richard B.; and Haarman, Johan W., 4,414,679., Cl. 378-29.000.

North American Philips Electric Corp.: *See—*
Young, Robert G., 4,414,489., Cl. 315-51.000.

Northern Telecom Inc.: *See—*
Burtelson, Frederick W., 4,414,426., Cl. 174-59.000.
Oliver, Theodore A.; Nelson, David L.; and Chan, Keat-Lye, 4,414,589., Cl. 360-77.000.

Northern Telecom Limited: *See—*
Baraff, David R.; Serinken, Nur M.; Streater, Richard W.; Miner, Carla J.; Boynton, Robert J.; MacLaurin, Blair K.; and Westwood, William D., 4,413,883., Cl. 350-334.000.
Kovats, Tibor F. I., 4,413,881., Cl. 350-96.200.
Lukas, Helmut H., 4,413,763., Cl. 225-2.000.
Parlor, Bryan R., 4,414,435., Cl. 179-81.00R.

Norton, David G.: *See—*
Losee, Paul D.; and Norton, David G., 4,414,592., Cl. 360-102.000.

Notelteirs, Victor R.; and Claessens, Stephanus J., to U.S. Philips Corporation. Electric incandescent lamp. 4,414,484., Cl. 313-273.000.

Nourigeon, Andre, to Grandes Boulangeries Associees G.B.A. Process for preparing deep-frozen yeast bread dough. 4,414,278., Cl. 426-19.000.

Novak, Robert F., to Ford Motor Company. Partial pressure of oxygen sensor-I. 4,414,531., Cl. 338-34.000.

Novak, Thaddeus J., to United States of America, Army. 4,4'-Dithiodianil. 4,414,414., Cl. 564-271.000.

Nowell, John R., to Honeywell Information Systems Inc. Regulated power supply. 4,414,598., Cl. 361-18.000.

Nutrisearch Company: *See—*
Lee, Chang R., 4,414,240., Cl. 426-614.000.

N.V. Klippan S.A.: *See—*
Weman, Per O., 4,413,794., Cl. 242-107.40A.

N.V. Raychem S.A.: *See—*
Nolf, Jean M. E., 4,413,922., Cl. 403-341.000.

Nye, Beatrice E. Rural mailbox. 4,413,770., Cl. 232-17.000.

O. G. Hoyer A/S: *See—*
Waldstrom, Ejvind, 4,413,461., Cl. 53-122.000.

Oak Industries Inc.: *See—*
Denley, Ronald S., 4,414,452., Cl. 200-159.00B.

O'Brien, C. Douglas: *See—*
Bown, Herbert G.; and O'Brien, C. Douglas, 4,414,621., Cl. 364-200.000.

Occidental Chemical Corporation: *See—*
Stachurski, John Z. O.; Pouli, Dirk; Ripa, John A.; and Pokrzyk, Gerald F., 4,414,064., Cl. 204-37.00R.

O'Connor, Lawrence. Apparatus for automatic traverse winding of tapes on a cylindrical core. 4,413,792., Cl. 242-67.10R.

Oestreich, Ulrich; Schoeber, Gernot; and Witt, Gerd, to Siemens Aktiengesellschaft. Method and device for producing an optical transmission element. 4,414,165., Cl. 264-1.500.

Oetiker, Hans. Hose coupling. 4,413,846., Cl. 285-317.000.

Ogasawara, Akira, to Nippon Kogaku K.K. Automatic focusing apparatus with detection only when the lens is stationary. 4,414,469., Cl. 250-201.000.

Ogasawara, Satoru, to Fuji Xerox Co., Ltd. Multiple line processing of video signals in a scanning type document reader. 4,414,582., Cl. 358-282.000.

Ogasawara, Takashi: *See—*
Kato, Harumitsu; Yamada, Hironori; Yamazaki, Kaoru; Maruyama, Masashi; and Ogasawara, Takashi, 4,413,703., Cl. 181-156.000.

Ogawa, Hidenori: *See—*
Tominaga, Michiaki; Yung-hsiung, Yang; Ogawa, Hidenori; and Nakagawa, Kazuyuki, 4,414,390., Cl. 546-121.000.

Oguchi, Toshihiko: *See—*
Endo, Hiroshi; Awa, Masashi; Iiri, Shigeo; Oguchi, Toshihiko; Suzuki, Isao; Hirate, Naoyuki; and Hayashi, Masaru, 4,414,124., Cl. 252-62.630.

Ogura, Hiroyuki; and Kuroda, Toyoyuki, to Raschel Co., Ltd. Basket goal net. 4,413,484., Cl. 66-193.000.

Ohe, Michisuke: *See—*
Iwata, Kaoru; Nishihara, Toshio; Ohe, Michisuke; Saito, Yoichi; and Horike, Akihiro, 4,414,254., Cl. 428-34.000.

Ohki, Kenji: *See—*
Tokuyama, Mitsuru; Tsuchiya, Yoshimi; Kawaguchi, Hikotaro; Sagae, Masayuki; and Ohki, Kenji, 4,414,255., Cl. 428-154.000.

Ohno, Mitsuo; and Hatazawa, Kikuo, to Hitachi, Ltd. Laser beam printer. 4,414,556., Cl. 346-160.000.

Ohshima, Nobumasa: *See—*
Habata, Etsuroh; Ohshima, Nobumasa; and Kanatani, Kenji, 4,414,052., Cl. 156-273.700.

Ohta, Hisatoshi: *See—*
Sasaki, Hiroaki; Inoue, Testuya; Mineo, Yoshiharu; Iguchi, Sei; Makita, Kazuhide; Arai, Hiroshi; Itoh, Hajime; Ohta, Hisatoshi; Inazu, Masahiro; and Kawahashi, Akira, 4,413,424., Cl. 33-361.000.

Ohta, Kenji; Takahashi, Akira; and Deguchi, Toshihisa, to Sharp Kabushiki Kaisha. Magneto-optic memory element. 4,414,650., Cl. 365-122.000.

Ohta, Minoru; Hattori, Yutaka; Kawakami, Tomio; and Onoda, Michitoshi, to Nippon Soken, Inc. Gas detecting sensor. 4,413,502., Cl. 73-23.000.

Ohtomo, Fumio: *See—*
Hamada, Toshio; and Ohtomo, Fumio, 4,413,904., Cl. 356-5.000.

Ohtsuki, Toshio: *See—*
Matsuzaka, Takashi; Ohtsuki, Toshio; Komori, Minoru; and Sakuma, Tsutomu, 4,414,139., Cl. 502-72.000.

Oil Air Industries, Inc.: *See—*
Allewitz, Murry, 4,413,652., Cl. 138-31.000.

Oil-Well Drilling Control, Inc.: *See—*
Croom, Robert E., Jr.; and Jeter, John D., 4,413,516., Cl. 73-431.000.

Oka, Yasuo: *See—*
Yoshida, Kohichi; Miyashita, Teruo; Oka, Yasuo; and Kajiyama, Takashi, 4,414,077., Cl. 204-35.00N.

Okabe, Moisei: *See—*
Kanamaru, Hisanobu; Tatsumi, Hideo; Sayo, Kosaku; and Okabe, Moisei, 4,413,717., Cl. 192-84.00C.

Okada, Hiroshi: *See—*
Sugiura, Junzi; Okada, Hiroshi; Hayashi, Michitaka; Yamazaki, Toru; and Sugimoto, Hiroshi, 4,413,527., Cl. 73-754.000.

Okamoto, Eisaku; and Mizuno, Kohtaro, to Nippon Gakki Seizo Kabushiki Kaisha. Music data reading type electronic musical instrument. 4,413,545., Cl. 84-1.280.

Okamoto, Hiroshi; Kudo, Tetsuichi; and Kawamura, Go, to Hitachi, Ltd. Process for producing hydrogen. 4,414,182., Cl. 423-652.000.
Okazaki, Masaki: *See*—
Masuda, Nobuhito; Mihara, Yuji; Okazaki, Masaki; and Makiuchi, Hajime, 4,414,325., Cl. 435-7.000.
Okazaki, Michio, to Diesel Kiki Co., Ltd. Swash-plate type compressor having pumpless lubricating system. 4,413,954., Cl. 417-269.000.
Okino, Ichiro: *See*—
Yoshioka, Hideoki; Okino, Ichiro; and Toda, Toshiaki, 4,414,529., Cl. 337-365.000.
Okuda, Kanemasa: *See*—
Nomura, Yoshiyuki; and Okuda, Kanemasa, 4,414,457., Cl. 219-69.00W.
Okutu, Toshimitu: *See*—
Miyoshi, Takahito; Okutu, Toshimitu; Akashi, Goro; Kitamoto, Tatsuji; and Fujiyama, Masaaki, 4,414,270., Cl. 428-325.000.
Olechowski, Jerome R.; and Lawson, Nelson E., to Union Camp Corporation. Method of polymerizing rosin. 4,414,146., Cl. 260-97.000.
Olin Corporation: *See*—
Pryor, Michael J., 4,413,813., Cl. 266-216.000.
Oliver, Theodore A.; Nelson, David L.; and Chan, Keat-Lye, to Northern Telecom Inc. Embedded servo track following system and method for writing servo tracks. 4,414,589., Cl. 360-77.000.
Olivieri, Edgar S., to Texaco Puerto Rico Inc. Method of detecting leaks in a large storage tank. 4,413,503., Cl. 73-40.700.
Olivieri, Roberto; Robertiello, Andrea; and Degen, Ludwig, to Snamprogetti, S.p.A. Compositions for depolluting fresh water and salt water bodies. 4,414,333., Cl. 435-243.000.
Olson, Joel J.: *See*—
Frisbie, Donald; Frisbie, Larry D.; and Olson, Joel J., 4,413,722., Cl. 198-392.000.
Olson, Larry D., to UOP Inc. Chip carrier substrates of hybrid woven glass cloths. 4,414,264., Cl. 428-241.000.
Olympus Optical Co., Ltd.: *See*—
Furihata, Hiroyuki, 4,414,608., Cl. 362-32.000.
Kimura, Tadashi, 4,413,887., Cl. 350-426.000.
Taira, Akio, 4,413,889., Cl. 350-501.000.
Omco Inc.: *See*—
Nielsen, Anker J., Jr., 4,413,490., Cl. 70-164.000.
Omholt, Bruce D. Motorcycle. 4,413,699., Cl. 180-219.000.
Omron Tateisi Electronics Co.: *See*—
Ueda, Kenji; and Miyamoto, Kiyoshi, 4,414,478., Cl. 307-116.000.
Ong, Helen H.: *See*—
Martin, Lawrence L.; Ong, Helen H.; Anderson, Vernon B.; and Crichlow, Charles A., 4,414,219., Cl. 424-267.000.
Onoda, Michitoshi: *See*—
Ohta, Minoru; Hattori, Yutaka; Kawakami, Tomio; and Onoda, Michitoshi, 4,413,502., Cl. 73-23.000.
Optimetrix Corporation: *See*—
Phillips, Edward H., 4,413,864., Cl. 308-5.00R.
Orangeburg Technologies, Inc.: *See*—
Burnham, Francis L., 4,413,952., Cl. 417-253.000.
Orifice Industries Ltd.: *See*—
Jahn, Guenter, 4,413,654., Cl. 138-92.000.
Orlander, Michael; Cotsworth, Robert P.; and MacKenzie, Peter A., to National Slag Limited. Apparatus for the pelletization of heat-liquifiable solid materials. 4,414,016., Cl. 65-141.000.
Orlowski, Ronald C.; and Seyler, Jay K., to Armour Pharmaceutical Company. Glycine^{8}-D-arginine^{24} calcitonin. 4,414,149., Cl. 260-112.50T.
Ortho Diagnostic Systems Inc.: *See*—
Dussault, Richard A., 4,414,197., Cl. 424-3.000.
Osamu, Ohe: *See*—
Ikushima, Koichi; Tanaka, Hirokazu; Osamu, Ohe; Kino, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; Arakawa, Akira; and Imanaka, Hiroshi, 4,414,226., Cl. 424-279.000.
Oshima, Kazunori: *See*—
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Osmond, Etienne J. R.: *See*—
Ferrieu, Gilbert M. M.; Osmond, Etienne J. R.; and Hetet, Yves J. F., 4,414,434., Cl. 179-77.000.
Osthaus, Georg: *See*—
Zucker, Friedrich J.; Osthaus, Georg; and Fisch, Klaus, 4,414,330., Cl. 435-93.000.
Ostrom, Carl R.; and Theilen, Dennis R., to Valmont Industries, Inc. Coupler for an irrigation system. 4,413,783., Cl. 239-183.000.
Otake, Masayuki; Hatano, Masakatsu; Koyama, Toru; Murayama, Masayoshi; and Oshima, Kazunori, to Mitsubishi Chemical Industries Limited. Catalytic composition. 4,414,133., Cl. 502-179.000.
Otani, Junji; Ikenoya, Yasuo; and Iwashita, Kanau, to Honda Giken Kogyo Kabushiki Kaisha. Method of making two-stage catalytic converter. 4,413,392., Cl. 29-157.00R.
Otis Engineering Corporation: *See*—
Perkins, Donald H., 4,413,677., Cl. 166-55.100.
Otsuka, Kiyotaka; and Tanahashi, Masao, to Matsushita Electric Works, Ltd. Electric shaver with rotary blade. 4,413,410., Cl. 30-43.600.
Otsuka, Pharmaceutical Co., Ltd.: *See*—
Tominaga, Michiaki; Yung-hsiung, Yang; Ogawa, Hidenori; and Nakagawa, Kazuyuki, 4,414,390., Cl. 546-121.000.
Otsuki, Hiroyuki: *See*—
Iwata, Toyotaro; Nakajima, Kunio; and Otsuki, Hiroyuki, 4,414,073., Cl. 204-299.00R.
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Schaefer, Gerd; Ott, Winfried; and Fleig, Gunther, 4,413,788., Cl. 239-703.000.
Ouderkirk, John T.: *See*—
Patil, Arvind S.; Bantjes, John H.; and Ouderkirk, John T., 4,414,033., Cl. 423-367.000.
Outboard Marine Corporation: *See*—
Hackbarth, Eugene R., 4,413,865., Cl. 308-207.00R.
Outokumpu Oy: *See*—
Makipirtti, Simo A. I.; Peuralinna, Mauri J.; Makitalo, Valto J.; Lilja, Launo L.; and Krogerus, Helge J., 4,413,816., Cl. 266-270.000.
Peuhkurinen, Eino J.; Lännanketo, Erkki J.; Farm, Kari M. U.; Kivisto, Tuomo V. J.; Koho, Tauno T.; Kinnunen, Seppo T.; and Taskinen, Martti P., 4,413,495., Cl. 72-196.000.
Oven, Judith L., to General Foods Limited. Topping coating. 4,414,239., Cl. 426-607.000.
Owens-Corning Fiberglas Corporation: *See*—
Seng, Stephen, 4,413,970., Cl. 425-222.000.
Owens-Illinois, Inc.: *See*—
Kontz, Robert F., 4,414,048., Cl. 156-159.000.
Pemberton, Ernest H.; Riggs, Darius O.; Mansor, Douglas J.; Sager, James R.; and Juvinall, John W., 4,413,738., Cl. 209-523.000.
Oxenrider, Bryce C., to Allied Corporation. Mixtures comprising fluorinated pyromellitate oligomers useful as surfactants and processes for the production and use thereof. 4,414,277., Cl. 428-395.000.
P C U K Produits Chimiques Ugine Kuhlmann: *See*—
Breda, Antoine G. L. J.; and Roussel, Jacques G. R., 4,414,151., Cl. 260-145.00B.
Pacer Technology and Resources, Inc.: *See*—
Stock, Hugh J., 4,413,753., Cl. 222-149.000.
Packard Industries, Inc.: *See*—
Hogue, Norman E., 4,413,489., Cl. 70-81.000.
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Murphy, John H.; Packer, Jon D.; and Brown, Dennis R., 4,414,200., Cl. 424-63.000.
Padovan, Mario: *See*—
DeAlberti, Giordano; Covini, Romano; Padovan, Mario; Battiston, Giancarlo; and Petrini, Guido, 4,414,412., Cl. 562-535.000.
Page, Enno H., to NL Industries, Inc. Expendable die casting sand core. 4,413,666., Cl. 164-72.000.
Palm, Jurgen; Glaser, Herbert; Collin, Gerd; and Marrett, Rolf, to Rutgerswerke Aktiengesellschaft. Method of producing a highly reactive pitch fraction and its usage. 4,414,192., Cl. 423-445.000.
Palmer, Bertram J., to GKN Transmissions Limited. Friction welding. 4,414,046., Cl. 156-73.500.
Palmer, Thomas W. Method for moisture-proofing refractory fiber for use in fire-resistant enclosures. 4,414,251., Cl. 427-407.100.
Panaro, Robert J., to Gould Inc. Electric fuse having composite fusible element. 4,414,526., Cl. 337-163.000.
Pandrol Limited: *See*—
Brown, Trevor P., 4,413,777., Cl. 238-349.000.
Panek, Karel J., to Byk-Millinkcrodt CIL B.V. Preparation and use of a 195M-AU-containing liquid. 4,414,145., Cl. 252-645.000.
Panknin, Walter: *See*—
Schneider, Franz; Panknin, Walter; Belamaric, Zelimir; and Schalch, Fred, 4,414,455., Cl. 219-64.000.
Panock, Richard L.: *See*—
Forrest, Stephen R.; Kohl, Paul A.; and Panock, Richard L., 4,414,066., Cl. 204-129.300.
Panzer, Klaus, to Siemens Aktiengesellschaft. Time division multiplex system having transmitted pulses in time channels distributed over and co-transmitted with a frame clock signal component. 4,414,663., Cl. 370-100.000.
Paquin, Patrick J., to Allied Corporation. Method of making low cross-talk ribbon cable. 4,413,469., Cl. 57-293.000.
Park, Chunghi H.: *See*—
Coplan, Myron J.; Park, Chunghi H.; and Williams, Samuel C., 4,414,368., Cl. 525-534.000.
Parker-Hannifin Corporation: *See*—
Knable, Raymond J., 4,413,549., Cl. 92-5.00R.
Parlor, Bryan R., to Northern Telecom Limited. Interface circuit with flux cancelling transformer circuit. 4,414,435., Cl. 179-81.00R.
Parry, Michael A.: *See*—
Slocombe, Joseph; and Parry, Michael A., 4,413,694., Cl. 180-89.140.
Slocombe, Joseph; and Parry, Michael A., 4,413,695., Cl. 180-89.140.
Slocombe, Joseph; and Parry, Michael A., 4,413,696., Cl. 180-89.140.
Parschat, Lothar: *See*—
Schrewe, Hans; Parschat, Lothar; Franken, Klaus; and Geisbusch, Peter, 4,413,667., Cl. 164-154.000.
Parsons, John H.; and West, Peter J., to FBC Limited. Pesticidal 1,2,4-triazole compounds. 4,414,221., Cl. 424-269.000.
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Newton, Stephen J.; and Patel, Abdul H., 4,414,465., Cl. 219-449.000.
Patel, Bhupendra P.: *See*—
Prusak, John J.; and Patel, Bhupendra P., 4,414,167., Cl. 264-40.500.
Patil, Arvind S.; Bantjes, John H.; and Ouderkirk, John T., to BASF Wyandotte Corporation. Process for preparing ferriferrocyanide pigments. 4,414,033., Cl. 423-367.000.
Paton, Boris E.; Latash, Jury V.; Zabarilo, Oleg S.; Melnik, Gary A.; Zamulo, Nikolai I.; Zhdanovsky, Anatoly A.; Bukalo, Alfred I.;

Goncharenko, Vladimir V.; Ivanchenko, Stanislav S.; Slobodian, Anatoly R.; Bakumenko, Sergei P.; and Zakamarkin, Mikhail K., to Institut Elektrosvarki Imeni E. O. Patona Akademii Nauk Ukrainskoi SSR. Plasma-arc furnace. 4,414,672., Cl. 373-22.000.

Paton, John S., to Greater Glasgow Health Board. Dispensing device having ratchet member. 4,413,760., Cl. 222-309.000.

Patricca, Steven E.; and Buchwalter, Stephen L., to PPG Industries, Inc. Self-curable resinous compositions useful in coating applications. 4,414,068., Cl. 204-181.00C.

Pawlowski, Stan: *See*—
Galindo, Rudolph D., 4,414,617., Cl. 362-404.000.

Paygro, Inc.: *See*—
Kipp, Carl E., Jr., 4,414,335., Cl. 435-313.000.

Payne, Larry D.; Cho, Hyun J.; and Mehta, Kishor N., to T. D. Williamson, Inc. Unitary pig for use in a pipeline. 4,413,370., Cl. 15-104.06R.

Pearce, Charlie I.: *See*—
Bittaker, Gerald W.; and Martinez, Evidio E., 4,413,364., Cl. 4-661.000.

Peeters, Guido J.: *See*—
De Bievre, Paul J.; Vansant, Etienne F.; and Peeters, Guido J., 4,414,005., Cl. 55-75.000.

Pejouhy, Radi: *See*—
Bouffard, Michael L.; and Pejouhy, Radi, 4,414,530., Cl. 338-25.000.

Pellegata, Renato; and Gandolfi, Carmelo, to Farmitalia Carlo Erba. Fluoro-prostaglandins and process for their preparation. 4,414,407., Cl. 424-305.000.

Pemberton, Ernest H.; Riggs, Darius O.; Mansor, Douglas J.; Sager, James R.; and Juvinall, John W., to Owens-Illinois, Inc. Apparatus and method for controlling the inspection of finished products. 4,413,738., Cl. 209-523.000.

Pendleton, James E. Body sled. 4,413,832., Cl. 280-12.00R.

Pennella, Filippo, to Phillips Petroleum Company. Removal of diene impurities from alkenes or alkanes over activated magnesium oxide under ultraviolet radiation. 4,414,083., Cl. 204-162.00R.

Peris, John M., to Hardinge Brothers, Inc. Bar stock feeder. 4,413,939., Cl. 414-17.000.

Perkins, Donald H., to Otis Engineering Corporation. Dual string well packer. 4,413,677., Cl. 166-55.100.

Perkins, Thomas K., to Atlantic Richfield Company. Wellbore cathodic protection. 4,413,679., Cl. 166-248.000.

Perna, Theodore P., to Xerox Corporation. Ink jet array. 4,414,553., Cl. 346-1.100.

Perry, Ralph A.; and Andrejasich, Raymond J., to Emhart Industries, Inc. Hydrocarbon responsive switch. 4,414,441., Cl. 200-61.040.

Personal Products Company: *See*—
Korpman, Ralf, 4,413,995., Cl. 604-368.000.

Pervel Industries, Inc.: *See*—
Rzepecki, Ray M.; and Weiss, Victor H., 4,414,260., Cl. 428-212.000.

Peter, Emmett B., III; and Rayfield, Wilson P., to Burroughs Corp. Four-bar interposer mechanism for offset printing. 4,413,902., Cl. 355-48.000.

Peters, Alan R., to Automation International Corp. Extrusion die. 4,413,973., Cl. 425-461.000.

Peters Machinery Co., Subsidiary of Katy Industries: *See*—
Rose, Edward, 4,413,462., Cl. 53-540.000.

Peters, Thomas: *See*—
Drude, Burkhard; Peters, Thomas; and Klapp, Eberhard, deceased, 4,414,114., Cl. 210-652.000.

Peterson, Michael: *See*—
Ferdinand, Irwin J.; Sylvan, Richard; and Peterson, Michael, 4,413,374., Cl. 16-121.000.

Peterson, Shepard J., to FMC Corporation. Weighing cup. 4,413,690., Cl. 177-54.000.

Petillo, Bruce: *See*—
Galindo, Rudolph D., 4,414,617., Cl. 362-404.000.

Petrik, John T.; and Westover, Brooke N., to Sun Chemical Corporation. Diesel glow-plug ignitor. 4,414,463., Cl. 219-270.000.

Petrini, Guido: *See*—
DeAlberti, Giordano; Covini, Romano; Padovan, Mario; Battiston, Giancarlo; and Petrini, Guido, 4,414,412., Cl. 562-535.000.

Petrolite Corporation: *See*—
Newberry, Michael E.; and Barker, Kenneth M., 4,414,035., Cl. 134-3.000.

Pettinger, Donald J. Rodent control device. 4,414,653., Cl. 367-139.000.

Pettit, George R., to University Patents, Inc. Cell growth inhibitory substances. 4,414,205., Cl. 424-177.000.

Pettus, Robert O.: *See*—
Summer, Charles F., Jr.; Pettus, Robert O.; Bonnell, Ronald D.; Huhns, Michael N.; and Stephens, Larry M., 4,414,624., Cl. 364-200.000.

Petty, Randall H.; and Bartley, Burton H., to Texaco Inc. Fluid catalytic cracking catalyst. 4,414,138., Cl. 502-73.000.

Peuhkurinen, Eino J.; Linnanketo, Erkki J.; Farm, Kari M. U.; Kivisto, Tuomo V. J.; Koho, Tauno T.; Kinnunen, Seppo T.; and Taskinen, Martti P., to Outokumpu Oy. Method for the stiffening and straightening of starting sheets. 4,413,495., Cl. 72-196.000.

Peuralinna, Mauri J.: *See*—
Makipirtti, Simo A. I.; Peuralinna, Mauri J.; Makitalo, Valto J.; Lilja, Launo L.; and Krogerus, Helge J., 4,413,816., Cl. 266-270.000.

Peyton, John J.; Thomason, Robert L.; and Evinger, Hubert W., to Industrial Automation Corporation. Sorting and inspection apparatus and method. 4,414,566., Cl. 358-101.000.

Pfizer Inc.: *See*—
Belletire, John L., 4,414,220., Cl. 424-267.000.
Kadin, Saul B., 4,414,388., Cl. 544-48.000.

Pfleger, Frederick W. Article handling apparatus. 4,413,720., Cl. 198-345.000.

Philip Morris Incorporated: *See*—
Dwyer, R. William, Jr.; and Fleming, Mabie L., 4,413,641., Cl. 131-361.000.
Irving, Christopher, 4,413,637., Cl. 131-84.00R.

Phillips, Edward H., to Optimetrix Corporation. Gas bearing. 4,413,864., Cl. 308-5.00R.

Phillips Petroleum Company: *See*—
Doss, Richard C., 4,414,107., Cl. 209-166.000.
Hitzman, Donald O., 4,414,334., Cl. 435-262.000.
Pennella, Filippo, 4,414,083., Cl. 204-162.00R.
Senatore, Guy; and Farrar, Ralph C., 4,414,340., Cl. 523-219.000.
Small, William M., 4,413,394., Cl. 29-157.30B.
Wegner, Eugene H., 4,414,329., Cl. 435-68.000.

Photon Power, Inc.: *See*—
Lampkin, Curtis M., 4,414,252., Cl. 427-424.000.

Piano, Renzo, to Fiat Auto S.p.A. Ventilation system for the passenger compartment of a motor vehicle. 4,413,550., Cl. 98-2.000.

Pichert, Ludwig: *See*—
Tenberg, Werner; and Pichert, Ludwig, 4,413,810., Cl. 266-94.000.

Pichler, Gunther; Rothhaas, Friedrich; and Hock, Hans, to Sistemco N.V. Heat resistant cabinet and method of manufacture. 4,413,869., Cl. 312-236.000.

Pieniak, Heinz A., to Johnson & Johnson Baby Products Company. Laminated structures having gathered and ungathered marginal portions and method of manufacturing the same. 4,413,623., Cl. 604-365.000.

Pieters, Ferdinandus A., to Micropump Corporation. Encapsulated magnet for magnetic drive. 4,414,523., Cl. 335-302.000.

Pieters, Wim J. M.: *See*—
Sherwood, Rexford D.; Baker, Rees T. K.; Derouane, Eric G.; and Pieters, Wim J. M., 4,414,256., Cl. 428-163.000.

Pietrini, Viktor: *See*—
Mandl, Gerhard; Mondini, Giancarlo; Pietrini, Viktor; Weber, Kurt; and Wildbolz, Rudolf, 4,413,378., Cl. 19-258.000.

Pietsch, Gunter, to Howaldtswerke-Deutsche Werft Aktiengesellschaft Hamburg und Kiel. Shaft sealing assembly. 4,413,829., Cl. 277-3.000.

Pietsch, Gunter, to Howaldtswerke-Deutsche Werft Aktiengesellschaft Hamburg und Kiel. Seal assembly for rotating shafts. 4,413,830., Cl. 277-27.000.

Pilot Man-Nen-Hitsu Kabushiki Kaisha: *See*—
Tokorozawa, Sadao, 4,413,751., Cl. 222-1.000.

Pinkston, Bruce H. W., to Union Carbide Corporation. Apparatus for mixing chemical components. 4,414,184., Cl. 422-133.000.

Pinson, Marvin J., Jr.: *See*—
Wang, Kenneth Y.; Hill, Berlie R.; and Pinson, Marvin J., Jr., 4,414,045., Cl. 156-73.200.

Pinteric, Frank W.: *See*—
Merdian, Anton W., Jr.; Jurneke, Joseph K.; and Pinteric, Frank W., 4,414,590., Cl. 360-97.000.

Pioneer Electronic Corporation: *See*—
Komatsubara, Masahiro; Kamimura, Tetsuro; Inanaga, Takugi; and Takahashi, Akira, 4,413,793., Cl. 242-68.000.
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Pioneer Speaker Components, Inc.: *See*—
Sashida, Iwao; and Haga, Tsutomu, 4,414,436., Cl. 179-110.00A.

Pirklbauer, Wilfried; and Nagl, Martin, to Voest-Alpine Aktiengesellschaft. Apparatus for discharging hot flowable solids, particularly sponge iron, from a shaft furnace. 4,413,812., Cl. 266-195.000.

Pithouse, Kenneth B., to Raychem Limited. Wrap-around device. 4,413,656., Cl. 138-110.000.

Pitts, Elvin C.; Burns, Walter G.; and Anderson, Harvey R., to King Energy Systems, Inc.; and Servamatic Solar Systems, Inc. Solar collector. 4,413,618., Cl. 126-450.000.

Pitts, Thomas E.: *See*—
Maddox, Edward L.; and Pitts, Thomas E., 4,414,476., Cl. 250-563.000.

Pittway Corporation: *See*—
Conforti, Frederick J.; and Fenne, Kenneth R., 4,414,612., Cl. 362-188.000.

Plack, Albert R.: *See*—
Varterasian, John H.; Plack, Albert R.; and Melichar, Jackson W., 4,413,838., Cl. 280-751.000.

Platt, Robert J.; and Shadbolt, Edward A., to Exxon Research and Engineering Co. Streamline coal slurry letdown valve. 4,413,646., Cl. 137-240.000.

Platzer, Maximilian F.; and Simmons, John M., to United States of America, Navy. Jet excitation by an oscillating vane. 4,413,782., Cl. 239-102.000.

Plonczak, Garold W.: *See*—
Farmer, Paul L.; Gibeau, Frank C.; Brown, Stanley F.; and Plonczak, Garold W., 4,414,594., Cl. 360-106.000.

Podgurski, Harry H.: *See*—
Davis, Frank N.; and Podgurski, Harry H., 4,414,043., Cl. 148-16.000.

Pohle, Richard H., to Lockheed Missiles & Space Co., Inc. Wavefront tilt measuring apparatus. 4,413,909., Cl. 356-354.000.

Poindexter, Graham S.; and Temple, David L., Jr., to Mead Johnson & Company. Dihydropyridyl cyclic imidate esters and their pharmaceutical use. 4,414,213., Cl. 424-248.500.

Poirier, Michel: *See—*
Boutin, Xavier; Compagnon, Francis; and Poirier, Michel, 4,414,646., Cl. 365-2.000.
Pokorny, Richard J., to Minnesota Mining and Manufacturing Company. Wire coating composition. 4,414,355., Cl. 524-462.000.
Pokrzyk, Gerald F.: *See—*
Stachurski, John Z. O.; Pouli, Dirk; Ripa, John A.; and Pokrzyk, Gerald F., 4,414,064., Cl. 204-37.00R.
Polak's Frutal Works, B.V.: *See—*
van den Bosch, Steven; van't Land, Evert; and Stoffelsma, Jan, 4,414,233., Cl. 426-535.000.
Polysar Limited: *See—*
Nettleton, James S., 4,413,971., Cl. 425-311.000.
Pomponio, Edward V., to Timex Corporation. Timed switch. 4,414,439., Cl. 200-38.00R.
Portmann, Robert: *See—*
Scherrer, Walter; and Portmann, Robert, 4,414,156., Cl. 260-352.000.
Portoghese, Joseph: *See—*
Berke, Herbert; and Portoghese, Joseph, 4,414,567., Cl. 358-139.000.
Potter, Steven E.: *See—*
Duffy, Brian J.; Gratz, Eugene J.; Potter, Steven E.; and Power, Royal A., 4,414,171., Cl. 264-249.000.
Potts, John E., Jr. Diesel locomotive fuel savings and protection system. 4,413,595., Cl. 123-142.50R.
Pouli, Dirk: *See—*
Stachurski, John Z. O.; Pouli, Dirk; Ripa, John A.; and Pokrzyk, Gerald F., 4,414,064., Cl. 204-37.00R.
Powell, Justin C., to Texaco Inc. Production of alkenyl substituted aliphatic dicarboxylic anhydrides. 4,414,397., Cl. 549-255.000.
Powell, Willie A.: *See—*
Avery, Randall N.; Clayton, Charles A.; Floyd, Levon R.; Mackintosh, Douglas B.; Powell, Willie A.; and Atkins, Michael W., 4,413,674., Cl. 165-104.330.
Power, Roy J., to Power-Soler, Inc. Molded foot bed. 4,413,429., Cl. 36-44.000.
Power, Royal A.: *See—*
Duffy, Brian J.; Gratz, Eugene J.; Potter, Steven E.; and Power, Royal A., 4,414,171., Cl. 264-249.000.
Power-Soler, Inc.: *See—*
Power, Roy J., 4,413,429., Cl. 36-44.000.
PPG Industries, Inc.: *See—*
Boyer, Nicodemus E., 4,414,396., Cl. 548-478.000.
Patricca, Steven E.; and Buchwalter, Stephen L., 4,414,068., Cl. 204-181.00C.
Prescott, Roger, to Great Lakes Carbon Corporation. Composite disc. 4,413,860., Cl. 301-63.0PW.
Prevorsek, Dusan C.: *See—*
Wu, Tse C.; Prevorsek, Dusan C.; and Wertz, David H., 4,4[illegible]4,366., Cl. 525-439.000.
Prewo, Karl M.: *See—*
Layden, George K.; and Prewo, Karl M., 4,414,011., Cl. 65-18.100.
Preziuso, Ciro: *See—*
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Price, Christopher P.: *See—*
Hammond, Peter M.; Price, Christopher P.; Scawen, Michael D.; and Atkinson, Anthony, 4,414,327., Cl. 435-18.000.
Prinz, Peter: *See—*
Erpenbach, Heinz; Gehrmann, Klaus; Lork, Winfried; and Prinz, Peter, 4,414,160., Cl. 260-544.00A.
Pritzkow, Dennis: *See—*
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Procter & Gamble Company, The: *See—*
Goffinet, Pierre C. E., 4,414,128., Cl. 252-111.000.
Proskow, Stephen: *See—*
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Prusak, John J.; and Patel, Bhupendra P., to RCA Corporation. Method for molding an article. 4,414,167., Cl. 264-40.500.
Pryor, Michael J., to Olin Corporation. Disposable bed filter apparatus. 4,413,813., Cl. 256-216.000.
Psyhojos, Triffin G.: *See—*
Villalobos, Joseph A.; and Psyhojos, Triffin G., 4,413,427., Cl. 34-46.000.
Public Health Laboratory Service Board: *See—*
Hammond, Peter M.; Price, Christopher P.; Scawen, Michael D.; and Atkinson, Anthony, 4,414,327., Cl. 435-18.000.
PUMA-Sportschuhfabriken Rudolf Dassler KG: *See—*
Cavanagh, Peter R., 4,413,431., Cl. 36-114.000.
Purex Corporation: *See—*
Aurthur, William B., 4,414,109., Cl. 210-278.000.
Hackett, Walter J.; and Galena, Peter E., 4,414,360., Cl. 524-560.000.
Purr, Gerhard, to Kraftwerk Union Aktiengesellschaft. Double shell steam turbine housing assembly. 4,413,948., Cl. 415-219.00R.
Q.P. Corporation: *See—*
Takano, Motoharu; and Hoshino, Minoru, 4,413,977., Cl. 432-56.000.
Queener, Carl A.: *See—*
Dattilo, Anthony J.; McDonald, James F.; and Queener, Carl A., 4,414,579., Cl. 358-256.000.
Quella, Ferdinand; and Hohmann, Eugen, to Siemens Aktiengesellschaft. Method for lubricating bearing and gear surfaces. 4,414,241., Cl. 427-2.000.
Quenton, Guy: *See—*
Duhomez, Roger; and Quenton, Guy, 4,413,815., Cl. 266-265.000.
Quest Corporation: *See—*
Wetzel, Donald C., 4,413,691., Cl. 177-147.000.
Quietlite International, Ltd.: *See—*
Elliott, William J., 4,414,491., Cl. 315-282.000.
Quinn, George P.: *See—*
Smith, Jeffrey S.; Quinn, George P.; and Vasalos, Iacovos A., 4,414,101., Cl. 208-153.000.
Quinn, Leonard L., to Dart Industries Inc. Barbecue fuel level gauge. 4,413,515., Cl. 73-296.000.
Radtke, Wolfgang: *See—*
Bergmann, Udo; Kurz, Heinrich; and Radtke, Wolfgang, 4,414,552., Cl. 346-1.100.
Ragaller, Klaus: *See—*
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Ragon, Danny L., to Deere & Company. Track recoil system. 4,413,862., Cl. 305-10.000.
RAI Research Corporation: *See—*
D'Agostino, Vincent F.; and Lee, Joseph Y., 4,414,090., Cl. 204-252.000.
Rainville Co., Inc.: *See—*
Rainville, Dewey, 4,414,175., Cl. 264-531.000.
Rainville, Dewey, to Rainville Co., Inc. Method for blowing oriented containers. 4,414,175., Cl. 264-531.000.
Randmae, Rein S., to Vicon Industries, Inc. Housing assembly for electrical apparatus. 4,414,576., Cl. 358-229.000.
Rankel, Lillian A.; and Rudnick, Leslie R., to Mobil Oil Corporation. Process for reducing nitrogen and/or oxygen heteroatom content of a mineral oil. 4,414,102., Cl. 208-211.000.
Ransburg GmbH: *See—*
Schaefer, Gerd; Ott, Winfried; and Fleig, Gunther, 4,413,788., Cl. 239-703.000.
Raphael, Richard A.; Eyley, Stephen C.; and Coltman, Stephen C. W., to Fisons Limited. Certain diacetyl-amino-phenolic derivatives. 4,414,416., Cl. 564-443.000.
Rapp, Fred J.: *See—*
Wade, Charles E., Jr.; and Rapp, Fred J., 4,413,557., Cl. 101-44.000.
Raptis, Apostolos C.: *See—*
Karplus, Henry H. B.; and Raptis, Apostolos C., 4,413,531., Cl. 73-861.250.
Rasberger, Michael, to Ciba-Geigy Corporation. Compositions stabilized with dioxaphosphepines. 4,414,345., Cl. 524-108.000.
Raschel Co., Ltd.: *See—*
Ogura, Hiroyuki; and Kuroda, Toyoyuki, 4,413,484., Cl. 66-193.000.
Rasmussen, Chris R., to McNeilab, Inc. Heterocyclic derivatives of guanidine. 4,414,211., Cl. 424-246.000.
Rau, Gerald A.: *See—*
Lanius, Charles A.; Hulterstrum, Harold D.; and Rau, Gerald A., 4,413,804., Cl. 251-144.000.
Rauschenbach, Dieter: *See—*
Weinhold, Harri; Vogel, Heinz-Rudiger; Kurze, Bernhard; Schlegel, Joachim; Rauschenbach, Dieter; Hering, Roland; Werner, Peter; and Wunsch, Heinz, 4,413,585., Cl. 118-61.000.
Rayborn, Grayson H.: *See—*
Singh, Jag J.; Wood, George M., Jr.; Rayborn, Grayson H.; and White, Frederick A., 4,414,509., Cl. 324-250.000.
Raychem Limited: *See—*
Pithouse, Kenneth B., 4,413,656., Cl. 138-110.000.
Rayfield, Wilson P.: *See—*
Peter, Emmett B., III; and Rayfield, Wilson P., 4,413,902., Cl. 355-48.000.
Raytheon Company: *See—*
Berlik, Lee J., 4,413,610., Cl. 126-39.00K.
Berlik, Lee J.; Barnes, S. Thomas; and Levi, David E., 4,413,611., Cl. 126-39.00E.
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RCA Corporation: *See—*
Bogner, Bruce F., 4,414,425., Cl. 174-35.0GC.
Flory, Robert E., 4,414,572., Cl. 358-172.000.
Marschka, Frank D., 4,414,485., Cl. 313-451.000.
McCusker, Joseph H.; Thaler, Barry J.; and Tsien, Wei H., 4,413,510., Cl. 73-150.00A.
Prusak, John J.; and Patel, Bhupendra P., 4,414,167., Cl. 264-40.500.
Tallant, James C., II; and Hettiger, James, 4,414,577., Cl. 358-242.000.
Wang, Chih C.; and Bates, Ronald F., 4,414,660., Cl. 369-286.000.
Rea, James H.: *See—*
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Recovery Technology Associates: *See—*
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Gast, Uwe; Jung, Eggert; Kuhn, Franz; Mollgaard, Klaus; Redecker, Friedrich; Sendtko, Ulrich; Sommer, Rudiger; Wellendorf, Klaus; and Knop, Hans-Georg, 4,414,635., Cl. 364-526.000.
Redey, Laszlo; and Vissers, Donald R. Multifunctional reference electrode. 4,414,093., Cl. 204-412.000.
Redmer, Frank; and Krippl, Kurt, to Bayer Aktiengesellschaft. Apparatus for the production of a reaction mixture. 4,413,912., Cl. 366-69.000.

Reed, Scott T.: *See—*
McCollister, Howard L.; and Reed, Scott T., 4,414,282., Cl. 428-433.000.

Reeder, Michael R.: *See—*
Bourassa, Ronald R.; and Reeder, Michael R., 4,414,057., Cl. 156-643.000.

Refractory Products Co.: *See—*
Woodruff, Richard K.; and Tedesco, Joseph P., 4,414,674., Cl. 373-130.000.

Regie Nationale des Usines Renault: *See—*
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Regioninvest i Norr AB: *See—*
Wiklund, Thore K. E., 4,413,643., Cl. 137-68.00R.

Reich, Karl; and Sieger, Heinz, to Teroson GmbH. Cyanoacrylate adhesive composition. 4,414,347., Cl. 524-168.000.

Reich, Ronald K.: *See—*
Anderson, Philip M., III; and Reich, Ronald K., 4,414,519., Cl. 335-208.000.

Reichenbach, Donald F.: *See—*
Cobbledick, David S.; Reichenbach, Donald F.; and Shanoski, Henry, 4,414,173., Cl. 264-257.000.

Reisem, Daniel E., to Minnesota Mining and Manufacturing Company. Low reluctance transformer core. 4,414,521., Cl. 335-281.000.

Reiss, Karl: *See—*
Mennicke, Stefan; Reiss, Karl; and Liebermann, Kurt, 4,414,296., Cl. 429-50.000.

Reith, Friedrich: *See—*
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Relyea, Richard D.: *See—*
Smith, Gary D.; and Relyea, Richard D., 4,413,642., Cl. 137-14.000.

Rembaum, Alan: *See—*
Williams, Roger M.; and Rembaum, Alan, 4,414,080., Cl. 204-129.000.

Rempel, Delmar. Mat cutter and guide system. 4,413,542., Cl. 83-455.000.

Remy, David C.: *See—*
Anderson, Paul S.; Christy, Marcia E.; Evans, Ben E.; and Remy, David C., 4,414,154., Cl. 260-245.700.

Renard, Pierre: *See—*
Billon, Alain; Renard, Pierre; Simandoux, Jean-Claude; and Heinrich, Gerard, 4,414,105., Cl. 208-309.000.

Rende, Dominic S., to Nalco Chemical. Method for sulfite pulping using water-soluble molybdenum containing compounds. 4,414,060., Cl. 162-36.000.

Rendek, Robert B.: *See—*
Sleeth, Rhule B.; Theiler, Richard F.; and Rendek, Robert B., 4,414,232., Cl. 426-266.000.

Renjilian, Armen; Curry, Thomas H.; and Siracusano, Elizabeth, to Albany International Corp. Resin containing textiles. 4,413,391., Cl. 28-166.000.

Research Products Rehovot Ltd.: *See—*
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Research Triangle Institute: *See—*
McCartney, Michael L., 4,414,431., Cl. 381-48.000.

Resler, Edwin L., Jr., to Cornell Research Foundation, Inc. Combustion control by prestratification. 4,413,593., Cl. 123-1.00A.

Resnick, Paul R., to Du Pont de Nemours, E. I., and Company. Vinyl ether monomers and polymers therefrom. 4,414,159., Cl. 260-465.600.

Resnick, Paul R.: *See—*
Silva, Raimund H.; Resnick, Paul R.; and Smith, Roger A., 4,414,280., Cl. 428-422.000.

Restrepo, Jose M. Fiber-reinforced cement, and process. 4,414,030., Cl. 106-90.000.

Retzlaff, Friedhelm: *See—*
Gross, Heinz; Reith, Friedrich; Retzlaff, Friedhelm; and Schlusnus, Karl H., 4,414,042., Cl. 148-12.00R.

Revlon, Inc.: *See—*
Fotiu, Eustace; Tietjen, Marlene; Goldner, Tibor; and Rosenblum, Philip, 4,413,921., Cl. 401-96.000.

Rexham Corporation: *See—*
Conley, Kenneth E., 4,414,316., Cl. 430-496.000.

Rhodes, Joseph A.: *See—*
Chin, John F.; Rhodes, Joseph A.; and Kusterer, James E., 4,414,010., Cl. 65-16.000.

Rhone-Poulenc Agrochimie: *See—*
Aubouy, Michel; Hamel, Pierre; and Molin, Marc, 4,414,415., Cl. 564-412.000.

Rice, Richard G.; Boissevain, Mathew G.; and Dubin, Robert R., to Measurex Corporation. Gas analyzer with fluid curtain. 4,413,911., Cl. 356-438.000.

Richard, Jackie, to Regie Nationale des Usines Renault. Device for locking an element in a stationary position for an automobile vehicle. 4,413,712., Cl. 192-4.00A.

Ricoh Company, Ltd.: *See—*
Karasawa, Shuichi; Matsumoto, Fuyuhiko; Tsushima, Shuichi; Saitou, Masatoshi; Ishida, Tsutomu; Ikeda, Kunihiko; Yoshikawa, Masao; and Sato, Tsutomu, 4,413,899., Cl. 355-4.000.
Nakaoka, Hideo, 4,414,470., Cl. 250-204.000.

Rieger, Franz: *See—*
Moser, Winfried; Muller, Klaus; and Rieger, Franz, 4,413,509., Cl. 73-117.300.

Riegler, Ernst: *See—*
Lugscheider, Walter; and Riegler, Ernst, 4,414,673., Cl. 373-22.000.

Rieke Corporation: *See—*
Summers, Kenneth L., 4,413,743., Cl. 215-216.000.

Rieke, Helmut: *See—*
Hesse, Theodor; Rieke, Helmut; and Kleine-Konig, Johannes, 4,413,933., Cl. 406-152.000.

Rienecker, Reimund; and Stricker, Walter, to J. M. Voith GmbH. Rotor for a pulper. 4,413,789., Cl. 241-46.170.

Rieter Machine Works Limited: *See—*
Mandl, Gerhard; Mondini, Giancarlo; Pietrini, Viktor; Weber, Kurt; and Wildbolz, Rudolf, 4,413,378., Cl. 19-258.000.

Riggs, Darius O.: *See—*
Pemberton, Ernest H.; Riggs, Darius O.; Mansor, Douglas J.; Sager, James R.; and Juvinall, John W., 4,413,738., Cl. 209-523.000.

Riggs, Olen L., Jr., to Kerr-McGee Chemical Corporation. Method for fabricating electrodes. 4,413,408., Cl. 29-825.000.

Riker Laboratories, Inc.: *See—*
Moore, George G. I., 4,414,217., Cl. 424-263.000.

Rines, Glen A., to Sanders Associates, Inc. Fiber optic acoustic signal transducer using reflector. 4,414,471., Cl. 250-227.000.

Ripa, John A.: *See—*
Stachurski, John Z. O.; Pouli, Dirk; Ripa, John A.; and Pokrzyk, Gerald F., 4,414,064., Cl. 204-37.00R.

Ripley, Ian S.: *See—*
McBride, Alistair D.; and Ripley, Ian S., 4,413,914., Cl. 366-137.000.

Ritter, Alfred E., to Studiengesellschaft Kohle mbH. Process for the energy-saving recovery of useful or available heat from the environment or from waste heat. 4,413,670., Cl. 165-1.000.

Ritter, Herbert W. Retainer strap for garbage can lid. 4,413,851., Cl. 292-259.000.

Roba, Giacomo; and Vergnano, Paolo, to Caselt - Centro Studi e Laboratori Telecomunicazioni S.p.A. Process and apparatus for producing preforms for optical fibers. 4,414,164., Cl. 264-1.200.

Robert Bosch GmbH: *See—*
Kuhlmann, Gerhard, 4,413,936., Cl. 408-8.000.
Moser, Winfried; Muller, Klaus; and Rieger, Franz, 4,413,509., Cl. 73-117.300.

Robertiello, Andrea: *See—*
Olivieri, Roberto; Robertiello, Andrea; and Degen, Ludwig, 4,414,333., Cl. 435-243.000.

Roberts, Peter T.: *See—*
Copp, Frederick C.; Roberts, Peter T.; Frenkel, Alexander D.; and Collard, David, 4,414,223., Cl. 424-273.00R.

Robertson Paper Box Co., Inc.: *See—*
Davidson, Thomas L., 4,413,726., Cl. 206-45.130.

Robinette, Susan L., to Xerox Corporation. Process for making photoreceptors. 4,414,179., Cl. 420-579.000.

Robinson, David R. Film holder support apparatus. 4,414,683., Cl. 378-177.000.

Rockwell International Corporation: *See—*
Akhtar-Khavari, Fuad; and Lobin, Bernard J., 4,413,388., Cl. 24-279.000.
Chen, Thomas T., 4,414,507., Cl. 324-210.000.
Enderson, Eugene S., 4,414,689., Cl. 455-221.000.

Rodd, Charles R.; Rodd, Doris M. E.; and Scheuerman, Richard L. Air pressure regulator. 4,413,649., Cl. 137-505.390.

Rodd, Doris M. E.: *See—*
Rodd, Charles R.; Rodd, Doris M. E.; and Scheuerman, Richard L., 4,413,649., Cl. 137-505.390.

Rodda, Donald, to Singer Company, The; and Rodda, Donald. Camming arrangement for thread handling device. 4,413,578., Cl. 112-254.000.

Rogge, Dieter, to Windmoller & Holscher. Flexographic printing press. 4,413,560., Cl. 101-247.000.

Rohde, Vernon C.; and Romanauskas, William A., to Du Pont de Nemours, E. I., and Company. Method and apparatus for centrifugal separation. 4,413,771., Cl. 494-17.000.

Rohde, Vernon C.; and Romanauskas, William A., to Du Pont de Nemours, E. I., and Company. Apparatus for centrifugal separation. 4,413,772., Cl. 494-17.000.

Rohde, Vernon C.; and Romanauskas, William A., to Du Pont de Nemours, E. I., and Company. Method and apparatus for centrifugal separation. 4,413,773., Cl. 494-37.000.

Rohm and Haas Company: *See—*
Miller, George A.; and Chan, Hak-Foon, 4,414,210., Cl. 424-245.000.

Rohrman, Albert C., Jr.: *See—*
Kokotailo, George T.; Rohrman, Albert C., Jr.; and Sawruk, Stephen, 4,414,189., Cl. 423-328.000.

Rojey, Alexandre, to Institut Francais du Petrole. Process for producing cold and/or heat by means of an absorption cycle. 4,413,479., Cl. 62-101.000.

Rolls Royce (1971) Limited: *See—*
Scott, Alexander, 4,413,949., Cl. 416-96.00A.

Romanauskas, William A., to Du Pont de Nemours, E. I., and Company. Method and apparatus for improving sedimentation field flow fractionation channels. 4,414,106., Cl. 209-155.000.

Romanauskas, William A.: *See—*
Rohde, Vernon C.; and Romanauskas, William A., 4,413,771., Cl. 494-17.000.
Rohde, Vernon C.; and Romanauskas, William A., 4,413,772., Cl. 494-17.000.
Rohde, Vernon C.; and Romanauskas, William A., 4,413,773., Cl. 494-37.000.

Romania, Samuel R.; and Watson, Frank L., to Burroughs Corporation. Cutting tool for use on printed circuit board wiring. 4,413,413., Cl. 30-300.000.

Romey, Ingo; and El-Roy, Menachem, to Bergwerksverband GmbH. Modified synthetic plastic from thermoplastic synthetics and coal hydrogenation residues. 4,414,344., Cl. 524-65.000.

Roos, Johannes P., to Indola Cosmetics B.V. Hair dryer casing. 4,413,428., Cl. 34-100.000.

Roper, Jerry M., to Ethyl Corporation. Process for producing N-acyl-D,L-phenylalanine ester. 4,414,404., Cl. 560-41.000.

Rosato, Dennis W.; and Lister, Neil K., to Millmaster Onyx Group, Inc. Insulation board. 4,414,265., Cl. 428-285.000.

Rose, Edward, to Peters Machinery Co., Subsidiary of Katy Industries. Accumulator and stacker for sandwiched biscuits and the like. 4,413,462., Cl. 53-540.000.

Rosenblum, Philip: *See*—
Fotiu, Eustace; Tietjen, Marlene; Goldner, Tibor; and Rosenblum, Philip, 4,413,921., Cl. 401-96.000.

Rosenhahn, Lothar: *See*—
Langen, Hans; Rosenhahn, Lothar; and Wolff, Erich, 4,414,309., Cl. 430-551.000.

Rosenthal, Manfred: *See*—
Weber, Wendelin; and Rosenthal, Manfred, 4,413,764., Cl. 226-170.000.

Ross Hill Controls Corporation: *See*—
Smith, Gary D.; and Relyea, Richard D., 4,413,642., Cl. 137-14.000.

Ross, Michael O.; and Marshek, Kurt M. Machine for testing chain and sprocket type drive systems. 4,413,513., Cl. 73-162.000.

Ross, William. Pivoting license plate bracket. 4,413,803., Cl. 248-475.00B.

Rossi, Louis J.: *See*—
Santilli, Domenic; Kaeding, Jeanne E.; and Rossi, Louis J., 4,414,152., Cl. 260-185.000.
Santilli, Domenic; Kaeding, Jeanne E.; and Rossi, Louis J., 4,414,320., Cl. 430-106.000.

Rossi, Michael J.: *See*—
Miller, Paul S.; and Rossi, Michael J., 4,413,367., Cl. 5-411.000.

Rossi, Robert M.: *See*—
Chino, John J.; LePage, Paul; Rossi, Robert M.; and Rossman, Herman, 4,414,605., Cl. 361-388.000.

Rossman, Herman: *See*—
Chino, John J.; LePage, Paul; Rossi, Robert M.; and Rossman, Herman, 4,414,605., Cl. 361-388.000.

Rotek Incorporated: *See*—
Geisey, James W., 4,413,866., Cl. 308-217.000.

Roth, Anton, deceased; and by Moeller, Guenther, executor, to Mercator Gesellschaft fur Entwicklung und Technik mbH. Lift-type car park. 4,413,942., Cl. 414-253.000.

Rothhaas, Friedrich: *See*—
Pichler, Gunther; Rothhaas, Friedrich; and Hock, Hans, 4,413,869., Cl. 312-236.000.

Roto-Finish Company, Inc.: *See*—
Balz, Gunther W., 4,413,448., Cl. 51-313.000.

Roussel, Jacques G. R.: *See*—
Breda, Antoine G. L. J.; and Roussel, Jacques G. R., 4,414,151., Cl. 260-145.00B.

Rowan, John W.: *See*—
Kiwalle, Jozef; Galloway, James H.; and Rowan, John W., 4,414,292., Cl. 429-19.000.

Ruckle, Duane L.: *See*—
Ulion, Nicholas E.; and Ruckle, Duane L., 4,414,249., Cl. 427-248.100.

Rudnick, Leslie R.: *See*—
Rankel, Lillian A.; and Rudnick, Leslie R., 4,414,102., Cl. 208-211.000.

Rudszinat, Willy: *See*—
Wahle, Gunter; and Rudszinat, Willy, 4,413,640., Cl. 131-281.000.

Rudy, William J., Jr.; and Zimmerman, John A., Jr., to AMP Incorporated. Preloaded electrical connector. 4,413,872., Cl. 339-59.00M.

Ruhrchemie Aktiengesellschaft: *See*—
Weber, Jurgen; Falk, Volker; and Kniep, Claus, 4,414,419., Cl. 568-421.000.

Rupert, John G.; and Jensen, Kenneth N. Subsurface sign assembly. 4,413,434., Cl. 40-10.00R.

Rupprecht, Eckhard: *See*—
Sauter, Robert; Griss, Gerhart; Grell, Wolfgang; Hurnaus, Rudolf; Eisele, Bernhard; Haarmann, Walter; and Rupprecht, Eckhard, 4,414,225., Cl. 424-274.000.

Rusk, Richard W. Guide system for flame cutting of pipe. 4,414,041., Cl. 148-9.600.

Rutgerswerke Aktiengesellschaft: *See*—
Palm, Jurgen; Glaser, Herbert; Collin, Gerd; and Marrett, Rolf, 4,414,192., Cl. 423-445.000.

Ruuth, Jonny. Thermostat. 4,414,520., Cl. 335-208.000.

Ruzic, David N.: *See*—
Timberlake, John R.; Ruzic, David N.; Moore, Richard L.; Cohen, Samuel A.; and Manos, Dennis M., 4,414,244., Cl. 427-105.000.

Ryan, Joseph L.; and Winfrey, Gerald N., to Honeywell Information Systems Inc. Hardware-firmware CRT display link system. 4,414,645., Cl. 364-900.000.

Ryan, Kenneth M.: *See*—
Liu, Thomas M. H.; Melillo, David G.; Ryan, Kenneth M.; Shinkai, Ichiro; and Sletzinger, Meyer, 4,414,155., Cl. 260-245.20T.

Ryan, William F., to Garrett Corporation, The. Fluidic thruster control and method. 4,413,795., Cl. 244-3.220.

Rybak, James P., to Magnetics International, Inc. Fabricated lifting magnet assembly. 4,414,522., Cl. 335-291.000.

Rybicki, Edward B., to Warner Lambert Technologies, Inc. Refractor optical system. 4,413,891., Cl. 351-235.000.

Rzepecki, Ray M.; and Weiss, Victor H., to Pervel Industries, Inc. Static dissipative upholstery fabric or the like. 4,414,260., Cl. 428-212.000.

S&C Electric Company: *See*—
Biller, Bruce A., 4,414,527., Cl. 337-180.000.

S. C. Johnson & Son, Inc.: *See*—
Hamielec, Archie E.; Lawless, Grant P.; and Schultz, Harold H., 4,414,370., Cl. 526-88.000.

Sacks, Michael. Protective shields. 4,413,357., Cl. 2-2.500.

Saeki, Taiichi: *See*—
Kureha, Takeshi; Kataoka, Teruo; Saeki, Taiichi; and Takeda, Minoru, 4,414,571., Cl. 358-158.000.

Sagae, Masayuki: *See*—
Tokuyama, Mitsaru; Tsuchiya, Yoshimi; Kawaguchi, Hikotaro; Sagae, Masayuki; and Ohki, Kenji, 4,414,255., Cl. 428-154.000.

Sager, James R.: *See*—
Pemberton, Ernest H.; Riggs, Darius O.; Mansor, Douglas J.; Sager, James R.; and Juvinall, John W., 4,413,738., Cl. 209-523.000.

Saijo, Kinji: *See*—
Shimizu, Nobuyoshi; Saijo, Kinji; Hizuka, Kenji; Inui, Tsuneo; and Kondo, Yoshikazu, 4,414,078., Cl. 204-34.000.

Saito, Yoichi: *See*—
Iwata, Kaoru; Nishihara, Toshio; Ohe, Michisuke; Saito, Yoichi; and Horike, Akihiro, 4,414,254., Cl. 428-34.000.

Saitou, Masatoshi: *See*—
Karasawa, Shuichi; Matsumoto, Fuyuhiko; Tsushima, Shuichi; Saitou, Masatoshi; Ishida, Tsutomu; Ikeda, Kunihiko; Yoshikawa, Masao; and Sato, Tsutomu, 4,413,899., Cl. 355-4.000.

Sakai Chemical Industry Co., Ltd.: *See*—
Matsumoto, Seiji; Koga, Tadashi; Fukai, Kiyoshi; and Yamamoto, Hideji, 4,414,196., Cl. 423-633.000.

Sakai, Yukio: *See*—
Nojiri, Naohiro; and Sakai, Yukio, 4,414,135., Cl. 502-224.000.

Sakamoto, Tsutomu: *See*—
Arai, Michio; Shiraogawa, Yukio; Sakamoto, Tsutomu; and Aoyagi, Keizo, 4,414,626., Cl. 364-200.000.

Sakiyama, Michio: *See*—
Imaoka, Hiroshi; Sakiyama, Michio; and Yamamoto, Masahiro, 4,413,498., Cl. 72-405.000.

Sakuma, Shinzo: *See*—
Kashimoto, Yutaka; Sakuma, Shinzo; Warabi, Junichi; Kobari, Yukio; and Kawaguchi, Hidemi, 4,414,448., Cl. 200-144.00B.

Sakuma, Tsutomu: *See*—
Matsuzaka, Takashi; Ohtsuki, Toshio; Komori, Minoru; and Sakuma, Tsutomu, 4,414,139., Cl. 502-72.000.

Sakurada, Hiroshi; and Aoyama, Naofumi, to Hitachi, Ltd. Memory circuit for generating liquid crystal display characters. 4,414,545., Cl. 340-790.000.

Salamon, Robert G.: *See*—
Loeb, Alfred A.; and Salamon, Robert G., 4,413,566., Cl. 102-517.000.

Sall, Gosta: *See*—
Hok, Bertil; and Sall, Gosta, 4,413,528., Cl. 73-753.000.

Salmon, Robert: *See*—
Matthey, Philippe; Salmon, Robert; and Buhlmann, Niklaus, 4,413,565., Cl. 102-503.000.

Sanagai, Mitsuru: *See*—
Tsuchimoto, Takamitsu; Kaneda, Saburo; Miyazawa, Tatsushi; Shimada, Toshio; Suzuki, Hideo; Sanagai, Mitsuru; and Hiraoka, Kaoru, 4,414,620., Cl. 364-200.000.

Sanders Associates, Inc.: *See*—
Rines, Glen A., 4,414,471., Cl. 250-227.000.

Sanders, David H. Portable, hand held, high pressure pump. 4,413,957., Cl. 417-415.000.

Sandhaus, Jeffrey. Child-resistant closure member. 4,413,742., Cl. 215-216.000.

Sandiford, Burton B.; Dovan, Hoai T.; and Hutchins, Richard D., to Union Oil Company of California. Permeability reduction in subterranean reservoirs. 4,413,680., Cl. 166-270.000.

Sankyo Company, Ltd.: *See*—
Konotsune, Takuo; and Kawakubo, Katsuhiko, 4,414,392., Cl. 548-105.000.

Sano, Yoshiaki, to Nihon Plast Co., Ltd.; and Yamato Plastics Machinery Co., Ltd. Method of producing ventilator grills. 4,414,170., Cl. 264-242.000.

Sanofi: *See*—
Jansen, Franz K.; and Gros, Pierre, 4,414,148., Cl. 260-112.00B.

Santa Barbara Reserarch Center: *See*—
Kvaas, Robert E., 4,414,040., Cl. 148-6.300.

Santilli, Domenic; Kaeding, Jeanne E.; and Rossi, Louis J., to Eastman Kodak Company. Bis aryl-azo derivatives of 2,3-naphthalenediol. 4,414,152., Cl. 260-185.000.

Santilli, Domenic; Kaeding, Jeanne E.; and Rossi, Louis J., to Eastman Kodak Company. Bis aryl-azo derivatives of 2,3-naphthalenediol and electrophotographic liquid developer compositions containing them. 4,414,320., Cl. 430-106.000.

Santini, Thomas F., to De Laire, Inc. Vapor dispersing device. 4,413,779., Cl. 239-45.000.

Sanyo Electric Co., Ltd.: *See*—
Takeichi, Toshio, 4,414,578., Cl. 358-243.000.

Sarashina, Hiromi, to Senko Medical Instrument Mfg. Co., Ltd. Intestinal irrigator for use with artificial anus. 4,413,994., Cl. 604-327.000.

Sasaki, Akio; and Echigo, Yoshiaki, to Unitika Ltd. Phenolic chelate resin, process for producing the same, and method of recovering heavy metal ions with the same. 4,414,183., Cl. 423-7.000.

Sasaki, Hiroaki; Inoue, Testuya; Mineo, Yoshiharu; Iguchi, Sei; Makita, Kazuhide; Arai, Hiroshi; Itoh, Hajime; Ohta, Hisatoshi; Inazu, Masahiro; and Kawahashi, Akira, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Azimuth determinating apparatus. 4,413,424., Cl. 33-361.000.

Sasaki, Ryoichi, to Nippon Electric Industry Co., Ltd. Pivot hinge with removable door closing device. 4,413,373., Cl. 16-54.000.

Sasaki, Sadayuki: *See*—
Fukushima, Tsutomu; Kawasaki, Kiyoshi; and Sasaki, Sadayuki, 4,414,026., Cl. 75-130.500.

Sasaki, Takesada; Endo, Hiroshi; Zama, Yoshimasa; Shiraishi, Masahiko; Miura, Yosinari; and Yamaguchi, Masayuki, to Nippon Steel Corporation. Exhaust pipe with vibration damping. 4,413,657., Cl. 138-149.000.

Sasano, Mitunori: *See*—
Ii, Akira; Sasano, Mitunori; Morishita, Michio; Kuno, Mikio; and Kadowaki, Kunio, 4,414,162., Cl. 261-23.00A.

Sashida, Iwao; and Haga, Tsutomu, to Pioneer Speaker Components, Inc. Narrow-frequency band acoustic transducer. 4,414,436., Cl. 179-110.00A.

Sasse, Howard A. Golf club. 4,413,825., Cl. 273-175.000.

Sato, Michio: *See*—
Kawaguchi, Yutaka; Sato, Michio; and Kasai, Shin, 4,413,791., Cl. 242-18.00G.

Sato, Soichiro. Connecting device for end of rope or bar and method for producing thereof. 4,413,386., Cl. 24-230.50R.

Sato, Toshihiko: *See*—
Inoue, Kazuo; Narisawa, Ryo; Wada, Ryuji; Sato, Toshihiko; and Irino, Hiroshi, 4,413,602., Cl. 123-486.000.

Sato, Tsutomu: *See*—
Karasawa, Shuichi; Matsumoto, Fuyuhiko; Tsushima, Shuichi; Saitou, Masatoshi; Ishida, Tsutomu; Ikeda, Kunihiko; Yoshikawa, Masao; and Sato, Tsutomu, 4,413,899., Cl. 355-4.000.

Sato, Yasuhisa, to Canon Kabushiki Kaisha. Compact photographic objective. 4,413,888., Cl. 350-432.000.

Sato, Yasushi: *See*—
Kato, Yuzo; Ishihara, Shunichi; Sato, Yasushi; Tanaka, Nobuyoshi; Kawamura, Naoto; and Nakatsui, Hisashi, 4,414,581., Cl. 358-280.000.

Satogosei Co., Ltd.: *See*—
Suzuki, Tadashi, 4,413,380., Cl. 24-16.0PB.

Satoh, Yoshiaki: *See*—
Watanabe, Ichiro; Satoh, Yoshiaki; and Yamaguchi, Yasumasa, 4,414,331., Cl. 435-129.000.

Sauter, Robert; Griss, Gerhart; Grell, Wolfgang; Hurnaus, Rudolf; Eisele, Bernhard; Haarmann, Walter; and Rupprecht, Eckhard, to Dr. Karl Thomae Gesellschaft mit beschrankter Haftung. Azepine derivatives and their anti-thrombotic compositions and methods. 4,414,225., Cl. 424-274.000.

Sauvey, Donald R., to Marmon Group, Inc., The. Single channel string ensemble sound system for an electronic musical instrument. 4,413,544., Cl. 84-1.240.

Savage, Charles E.: *See*—
Geel, Zane H.; Hornby, Roger B.; Lipps, Bennie J.; Savage, Charles E.; and Vanat, Pierre, 4,414,110., Cl. 210-321.300.

Sawada, Daisaku: *See*—
Shigematsu, Takashi; Watanabe, Tomoyuki; and Sawada, Daisaku, 4,413,599., Cl. 123-425.000.

Sawataishi, Tokio: *See*—
Tokuda, Kazuo; and Sawataishi, Tokio, 4,414,569., Cl. 358-153.000.

Sawruk, Stephen: *See*—
Kokotailo, George T.; Rohrman, Albert C., Jr.; and Sawruk, Stephen, 4,414,189., Cl. 423-328.000.

Sayo, Kosaku: *See*—
Kanamaru, Hisanobu; Tatsumi, Hideo; Sayo, Kosaku; and Okabe, Moisei, 4,413,717., Cl. 192-84.00C.

Scawen, Michael D.: *See*—
Hammond, Peter M.; Price, Christopher P.; Scawen, Michael D.; and Atkinson, Anthony, 4,414,327., Cl. 435-18.000.

Schade, Ekkehard: *See*—
Moll, Rudolf; Ragaller, Klaus; and Schade, Ekkehard, 4,414,450., Cl. 200-147.00R.

Schaefer, Gerd; Ott, Winfried; and Fleig, Gunther, to Ransburg GmbH. Device for the feeding of enamel to an electrostatic paint emitter. 4,413,788., Cl. 239-703.000.

Schalch, Fred: *See*—
Schneider, Franz; Panknin, Walter; Belamaric, Zelimir; and Schalch, Fred, 4,414,455., Cl. 219-64.000.

Schall, Wolfgang: *See*—
Hoffmann, Peter; Hugel, Helmut; Schall, Wolfgang; and Schock, Wolfram, 4,414,488., Cl. 315-39.000.

Scheidel, Max: *See*—
Ellendt, Gunther; Gleitsmann, Gunter; and Scheidel, Max, 4,414,074., Cl. 203-21.000.

Scheihing, Paul E.; and Laurelli, James A., to Electric Power Research Institute, Inc. Catalytic combustion system for a stationary combustion turbine having a transition duct mounted catalytic element. 4,413,470., Cl. 60-39.320.

Schelling & Co., Firma: *See*—
Kollmann, Horst, 4,413,941., Cl. 414-35.000.

Scherer, Richard M., to Southbend Escan Corporation. Igniter for a gas burner. 4,413,976., Cl. 431-278.000.

Scherrer, Walter; and Portmann, Robert, to Ciba-Geigy AG. Process for producing 2-methoxybenzanthrones. 4,414,156., Cl. 260-352.000.

Scheuerman, Richard L.: *See*—
Rodd, Charles R.; Rodd, Doris M. E.; and Scheuerman, Richard L., 4,413,649., Cl. 137-505.390.

Schilling, Curtis L., Jr.; Williams, Thomas C.; and Wesson, John P., to Union Carbide Corporation. Branched polycarbosilanes and their use in the production of silicon carbide. 4,414,403., Cl. 556-430.000.

Schilling, Walter: *See*—
Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, 4,414,394., Cl. 548-451.000.

Schils, Petrus J. R., to Keystone International, Inc. Method of manufacturing a valve assembly. 4,413,393., Cl. 29-157.10R.

Schindler, Harvey D., to Lummus Company, The. Hydrotreating catalyst. 4,414,141., Cl. 502-314.000.

Schindler, Johannes G., to Dr. E. Fresenius Chemisch-pharmazeutische Industrie KG Apparatebau KG. Polarographic catheter probe. 4,413,627., Cl. 128-635.000.

Schjeldahl, Gilmore T.; and Sharma, B., to Angiomedics Corporation. Expandable occlusion apparatus. 4,413,989., Cl. 604-96.000.

Schlanger, Samuel L., to Mauer, Gail B.; and Cohen, Ellen R., a part interest. Vehicle control safety system. 4,413,702., Cl. 180-274.000.

Schlegel, Joachim: *See*—
Weinhold, Harri; Vogel, Heinz-Rudiger; Kurze, Bernhard; Schlegel, Joachim; Rauschenbach, Dieter; Hering, Roland; Werner, Peter; and Wunsch, Heinz, 4,413,585., Cl. 118-61.000.

Schlessinger, Joseph E.; and Hamilton, Richard G., to Critikon, Inc. Pulmonary monitor. 4,413,632., Cl. 128-716.000.

Schlumberger Technology Corporation: *See*—
Hepp, Vincent R., 4,414,656., Cl. 367-25.000.

Schlusnus, Karl H.: *See*—
Gross, Heinz; Reith, Friedrich; Retzlaff, Friedhelm; and Schlusnus, Karl H., 4,414,042., Cl. 148-12.00R.

Schmick, Robert C.: *See*—
Sims, James E.; and Schmick, Robert C., 4,414,459., Cl. 219-73.200.

Schmid & Wezel, Firma: *See*—
Wetzel, Ludwig, 4,413,412., Cl. 30-169.000.

Schmidl, Mary K., to Cutter Laboratories, Inc. Liquid elemental diet. 4,414,238., Cl. 426-602.000.

Schmidt, Martin; Kohler, Walter; Loch, Hans-Ulrich; and Weber, Albrecht, to Klockner-Humboldt-Deutz AG. Method and apparatus for calcining limestone in a shaft kiln. 4,414,186., Cl. 423-175.000.

Schmidt, Paul J.; and Hung, William M., to Sterling Drug Inc. 5/6 Carboxyphthalides. 4,414,399., Cl. 549-309.000.

Schmidt, Terrance C., to Electrohome Limited. Regulation of the scan width of a raster scanned CRT deflection system. 4,414,494., Cl. 315-395.000.

Schmitz, John B.; and Schmitz, William L. Dual dose ampule. 4,413,991., Cl. 604-191.000.

Schmitz, William L.: *See*—
Schmitz, John B.; and Schmitz, William L., 4,413,991., Cl. 604-191.000.

Schneider, Franz; Panknin, Walter; Belamaric, Zelimir; and Schalch, Fred, to L. Schuler GmbH. Method of and apparatus for producing can bodies welded along the longitudinal seam. 4,414,455., Cl. 219-64.000.

Schneider, Friedrich, to G. Rau GmbH & Co. Process for producing a contact element. 4,414,444., Cl. 219-121.0LM.

Schneider, John T., to Allied Corporation. Variable motor speed control. 4,414,500., Cl. 318-799.000.

Schnizlein, Paul G., to Teletype Corporation. Keyboard sense gate. 4,414,538., Cl. 340-365.00S.

Schock, Wolfram: *See*—
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Schrock, Peter. Apparatus for pressure testing tubing. 4,413,501., Cl. 73-49.600.

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Kotwica, Roland, 4,414,398., Cl. 549-262.000.

Societe d'Applications des Machines Motrices: *See*—
Devaud, Gerard L., 4,413,547., Cl. 91-216.00R.

Societe D'Applications Generales D/Electricite et de Mecanique Sagem: *See*—
Boutin, Xavier; Compagnon, Francis; and Poirier, Michel, 4,414,646., Cl. 365-2.000.

Societe J. G. Allinquant: *See*—
Bich, Rene, 4,413,817., Cl. 267-64.110.

Societe Nationale Industrielle et Aerospatiale: *See*—
Bousquet, Jean, 4,413,796., Cl. 244-35.00R.

Societe Nouvelle de Bouchons Plastiques S.N.B.P.: *See*—
Babiol, Pierre, 4,413,744., Cl. 215-355.000.

Soden, Robert A., to Sonic Instruments, Inc. Apparatus and method for determining thickness. 4,413,517., Cl. 73-597.000.

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Farnham, William B.; and Sogah, Dotsevi Y., 4,414,372., Cl. 526-190.000.

Soika, Emil H., to Baxter Travenol Laboratories, Inc. Cannula support assembly and its method of manufacture. 4,413,992., Cl. 604-263.000.

Solc, Jitka; and Harris, Robert F., to Dow Chemical Company, The. Low density, electromagnetic radiation absorption composition. 4,414,339., Cl. 523-137.000.

Solis S.r.l.: *See*—
Gazzarrini, Vinicio, 4,413,575., Cl. 112-129.000.

Sommer, Rudiger: *See*—
Gast, Uwe; Jung, Eggert; Kuhn, Franz; Mollgaard, Klaus; Redecker, Friedrich; Sendtko, Ulrich; Sommer, Rudiger; Wellendorf, Klaus; and Knop, Hans-Georg, 4,414,635., Cl. 364-526.000.

Song, Hubert, to Verbatim Corporation. Digitally controllable electronic damper. 4,414,497., Cl. 318-696.000.

Sonic Instruments, Inc.: *See*—
Soden, Robert A., 4,413,517., Cl. 73-597.000.

Sony Corporation: *See*—
Horie, Masao; Sunada, Yusuke; and Inari, Junta, 4,414,433., Cl. 179-70.000.
Ive, John G. S.; and Thirlwall, Alan C., 4,414,677., Cl. 375-116.000.

Sorensen, Jens O.: *See*—
Kira, Gene S.; and Sorensen, Jens O., 4,413,476., Cl. 60-641.800.

Souk, Jun H.: *See*—
Charlson, Paul M.; Schwieters, Clarence R.; and Souk, Jun H., 4,414,166., Cl. 264-25.000.

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Huon de Kermadec, Jean, 4,413,568., Cl. 104-20.000.

Southard, Jesse M.; and Diehl, John E. Rolled bale handler. 4,413,940., Cl. 414-24.600.

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Scherer, Richard M., 4,413,976., Cl. 431-278.000.

Southwest Research Institute: *See*—
Tomlinson, Samuel J., Sr.; Dean, Edward E.; and Adams, Leon M., 4,414,227., Cl. 424-331.000.

Spalding, David N., to Britax-Excelsior Limited. Buckles for harnesses. 4,413,383., Cl. 24-164.000.

Spar Aerospace Limited: *See*—
Norman, Robert D., 4,413,538., Cl. 81-57.130.

Specht, Victor J. Positionable control device for a variable delivery pump. 4,413,960., Cl. 418-19.000.

Spector, George: *See*—
Ward, Michael L.; and Spector, George, 4,413,436., Cl. 40-160.000.

Spence, Gavin G.: *See*—
Maslanka, William W.; and Spence, Gavin G., 4,414,353., Cl. 524-458.000.

Spence, John S., to Alcan International Limited. Anode positioning system. 4,414,070., Cl. 204-225.000.

Sperry Limited: *See*—
Walters, Ronald B.; and Hammond, Anthony G., 4,413,648., Cl. 137-486.000.

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Dougherty, David J.; Gunesin, Binnur; and Spiewak, John W., 4,414,359., Cl. 524-555.000.

Spokane Industries, Inc.: *See*—
Tenold, Tyrus N.; Cossette, Michael D.; Kuntz, James P.; and Gordon, Jack D., 4,413,747., Cl. 220-225.000.

Springer, Gilbert D., to Ferix Corporation. Magnetic imaging apparatus. 4,414,554., Cl. 346-74.500.

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Taylor, Verner L.; Sprowls, Joseph B., III; and Ayer, James R., 4,414,546., Cl. 340-825.300.

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Zangerle, Ernst, 4,413,659., Cl. 140-3.0CA.

Sreenivasan, Baratham; and Baker, Kenneth S., to Lever Brothers Company. Naturally colored oleomargarine. 4,414,234., Cl. 426-540.000.

SRI International: *See*—
Weaver, Charles S.; Chadwick, Joseph H.; Yarborough, John M., Jr.; Brown, Floyd A.; and Burch, Donald J., 4,414,587., Cl. 360-76.000.

Srinivasan, Rangaswamy: *See*—
Blum, Samuel E.; Brown, Karen H.; and Srinivasan, Rangaswamy, 4,414,059., Cl. 156-659.100.

Stachurski, John Z. O.; Pouli, Dirk; Ripa, John A.; and Pokrzyk, Gerald F., to Occidental Chemical Corporation. Method for preparing low voltage hydrogen cathodes. 4,414,064., Cl. 204-37.00R.

Staff, Bonner W.: *See*—
Davis, Hubert B.; Staff, Bonner W.; and Willis, James A., 4,414,508., Cl. 324-238.000.

Standard Oil Co., The: *See*—
Friedrich, Maria S.; Suresh, Dev D.; and Grasselli, Robert K., 4,414,134., Cl. 502-204.000.

Standard Oil Company (Indiana): *See*—
Fields, Ellis K., 4,414,406., Cl. 560-109.000.
Smith, Jeffrey S.; Quinn, George P.; and Vasalos, Iacovos A., 4,414,101., Cl. 208-153.000.
West, C. Thomas; and Basalay, Robert J., 4,414,122., Cl. 252-49.700.

Stanek, Jaroslav: *See*—
Tarcsay, Lajos; Baschang, Gerhard; Hartmann, Albert; and Stanek, Jaroslav, 4,414,204., Cl. 424-177.000.

Stang, John H.; and Cusick, Steven N., to Cummins Engine Company, Inc. Oil cooled internal combustion engine. 4,413,597., Cl. 123-41.420.

Stanley Electric Co., Ltd.: *See*—
Nishizawa, Jun-ichi; and Teshima, Toru, 4,414,558., Cl. 357-17.000.

Stanley, Philip E., to Honeywell Information Systems Inc. Adjustable clock system having a dynamically selectable clock period. 4,414,637., Cl. 364-569.000.

Stapro AG: *See*—
Gabriel, Fredy, 4,413,799., Cl. 248-59.000.

Star Engineering Applications Limited: *See*—
Tune, Herbert E., 4,413,604., Cl. 123-515.000.

Stauffer Chemical Company: *See*—
Giolito, Silvio L., 4,414,161., Cl. 260-975.000.
Gutman, Arnold D., 4,414,019., Cl. 71-91.000.

Stedman, Robert N., to Caterpillar Tractor Co. Industrial truck with pivotal front frames. 4,413,708., Cl. 187-9.00R.

Steensen, Wayne L.: *See*—
Evans, David N.; Jarvis, Gary W.; Steensen, Wayne L.; and Shah, Manoj Kumar O., 4,414,237., Cl. 426-589.000.

Steffen, Alvin R.: *See*—
Featherstone, Harry E.; and Steffen, Alvin R., 4,413,451., Cl. 52-28.000.

Steiger, Gerard, to Atelier de Construction Steiger S.A. Cam-support for a knitting machine. 4,413,482., Cl. 66-78.000.

Stein, Jay A.: *See*—
Annis, Martin; and Stein, Jay A., 4,414,682., Cl. 378-146.000.

Steinberg, Eric: *See*—
Gould, George K.; and Steinberg, Eric, 4,414,467., Cl. 235-381.000.

Stephens, David G.: *See*—
Leatherwood, Jack D.; Dempsey, Thomas K.; Clevenson, Sherman A.; and Stephens, David G., 4,413,522., Cl. 73-646.000.

Stephens, Larry M.: *See*—
Summer, Charles F., Jr.; Pettus, Robert O.; Bonnell, Ronald D.; Huhns, Michael N.; and Stephens, Larry M., 4,414,624., Cl. 364-200.000.

Stephenson, Robert F.: *See*—
Williamson, Thomas R., III; Jones, Beth B.; Field, Harold; and Stephenson, Robert F., 4,414,303., Cl. 429-217.000.

Sterling Drug Inc.: *See*—
Schmidt, Paul J.; and Hung, William M., 4,414,399., Cl. 549-309.000.

Sternberg, Robert L., to United States of America, Navy. Ellipticized acoustical liquid filled lens providing balanced astigmatism. 4,413,704., Cl. 181-176.000.

Sternberg, Stanley R. Method and apparatus for pattern recognition and detection. 4,414,685., Cl. 382-49.000.

Stewart Folk & Company, Incorporated: *See*—
Folk, Stewart H., 4,413,859., Cl. 299-4.000.

Stewart-Warner Corporation: *See*—
Mayer, William R., 4,414,613., Cl. 362-267.000.

Stobb, Inc.: *See*—
Stobb, Walter J., 4,413,723., Cl. 198-415.000.

Stobb, Walter J., to Stobb, Inc. Method and apparatus for conveying a sheet. 4,413,723., Cl. 198-415.000.

Stock, Hugh J., to Pacer Technology and Resources, Inc. Dispenser for cyanoacrylate adhesives. 4,413,753., Cl. 222-149.000.

Stoffelsma, Jan: *See*—
van den Bosch, Steven; van't Land, Evert; and Stoffelsma, Jan, 4,414,233., Cl. 426-535.000.

Stokes, Olen L., Jr.: *See*—
Laurer, George J.; and Stokes, Olen L., Jr., 4,414,468., Cl. 235-462.000.

Stoll, William M.: *See*—
Newman, Harold C.; and Stoll, William M., 4,414,029., Cl. 75-252.000.

Storage Technology Corporation: *See*—
Merdian, Anton W., Jr.; Jurneke, Joseph K.; and Pinteric, Frank W., 4,414,590., Cl. 360-97.000.

Storage Technology Partners: *See*—
Zasio, John J., 4,414,480., Cl. 307-443.000.

Storni, Angelo: *See*—
Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, 4,414,394., Cl. 548-451.000.

Stout, Robert L., to BMA Laboratory Services, Inc. Immunoassay method and apparatus. 4,414,324., Cl. 435-7.000.

Stovall, David T. Shaft alignment tool. 4,413,415., Cl. 33-181.00R.

Strandwitz, Peter: *See*—
McMillin, John R.; and Strandwitz, Peter, 4,413,752., Cl. 222-56.000.

Strange, R. L. Deadbolt lock protector. 4,413,492., Cl. 70-416.000.

Streater, Richard W.: *See*—
Baraff, David R.; Serinken, Nur M.; Streater, Richard W.; Miner, Carla J.; Boynton, Robert J.; MacLaurin, Blair K.; and Westwood, William D., 4,413,883., Cl. 350-334.000.

Stricker, Walter: *See*—
Rienecker, Reimund; and Stricker, Walter, 4,413,789., Cl. 241-46.170.

Strobridge, John R., to Amway Corporation. Toothpaste. 4,414,199., Cl. 424-52.000.

Strom, Robert M.: *See*—
Ash, Mary L.; Diephouse, Timothy R.; and Strom, Robert M., 4,414,422., Cl. 568-724.000.

Strong, Ronald W.: *See*—
Daubendiek, Richard L.; and Strong, Ronald W., 4,414,310., Cl. 430-567.000.

Stroud, Ray D., to Continental Plastics. Tray caddy for waitresses. 4,413,745., Cl. 220-23.400.

Strzalka, Marion W. Hand held portable band saw. 4,413,414., Cl. 30-380.000.

Stuchlik, Terence J.: *See*—
Beugelsdyk, Anthony F.; Stuchlik, Terence J.; and Kester, Bruce J., 4,413,466., Cl. 56-11.300.

Studiengesellschaft Kohle mbH: *See*—
Ritter, Alfred E., 4,413,670., Cl. 165-1.000.

Studinka, Josef; and Meier, Peter E., to Ametex AG. Fiber-containing products made with hydraulic binder agents. 4,414,031., Cl. 106-90.000.

Suda, Hiroyuki: *See*—
Suto, Shoichi; Suda, Hiroyuki; Hanawa, Fumiaki; Nakahara, Motohiro; and Inagaki, Nobuo, 4,414,012., Cl. 65-18.200.

Sudo, Shigeru; and Yada, Masaaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of sealing a tube using a laser beam. 4,414,460., Cl. 219-121.0LD.

Sugamori, Shigeru: *See*—
Kimura, Kenji; Sugamori, Shigeru; Ishikawa, Kohji; and Narumi, Naoaki, 4,414,665., Cl. 371-21.000.

Sugimoto, Hiroaki; and Hanabata, Makoto, to Sumitomo Chemical Company, Limited. Process for producing an aromatic polyester composition. 4,414,365., Cl. 525-437.000.

Sugimoto, Hiroshi: *See*—
Sugiura, Junzi; Okada, Hiroshi; Hayashi, Michitaka; Yamazaki, Toru; and Sugimoto, Hiroshi, 4,413,527., Cl. 73-754.000.

Sugimoto, Kenji: *See*—
Ishizuka, Shinichi; and Sugimoto, Kenji, 4,413,539., Cl. 82-2.00R.

Sugiura, Junzi; Okada, Hiroshi; Hayashi, Michitaka; Yamazaki, Toru; and Sugimoto, Hiroshi, to Nippondenso Co., Ltd. Semiconductor pressure sensor. 4,413,527., Cl. 73-754.000.

Sullenger, Gordon A. Pneumatic tire. 4,413,663., Cl. 152-353.00R.

Sulzer Brothers Limited: *See*—
Mandrin, Charles, 4,414,195., Cl. 423-580.000.

Sumi, Masahiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Data compressing system. 4,414,536., Cl. 340-347.0DD.

Sumi, Masaoki; and Doi, Tomoyuki, to Kashifuji Works, Ltd. Synchronism equipment for gear cutting machines. 4,414,495., Cl. 318-571.000.

Sumitomo Chemical Company, Limited: *See*—
Hanabata, Makoto; Maruyama, Takashi; and Ueno, Katsuji, 4,414,230., Cl. 426-106.000.
Shiga, Akinobu; Matsuyama, Kiyoshi; Kakugo, Masahiro; Naito, Yukio; Ima, Seiichiro; and Yamashita, Katsuyoshi, 4,414,373., Cl. 526-348.000.
Sugimoto, Hiroaki; and Hanabata, Makoto, 4,414,365., Cl. 525-437.000.

Sumitono Electric Inds., Ltd.: *See*—
Edahiro, Takao; Miyajiri, Tetsuo; Yokota, Hiroshi; and Kuwahara, Toru, 4,414,008., Cl. 65-3.120.

Summer, Charles F., Jr.; Pettus, Robert O.; Bonnell, Ronald D.; Huhns, Michael N.; and Stephens, Larry M., to United States of America, Navy. Multiple-microcomputer processing. 4,414,624., Cl. 364-200.000.

Summers, Kenneth L., to Rieke Corporation. Child-resistant safety closure. 4,413,743., Cl. 215-216.000.

Sun Chemical Corporation: *See*—
Petrik, John T.; and Westover, Brooke N., 4,414,463., Cl. 219-270.000.

Sunada, Yusuke: *See*—
Horie, Masao; Sunada, Yusuke; and Inari, Junta, 4,414,433., Cl. 179-70.000.

Suncor, Inc.: *See*—
Yong, Raymond N.; and Sethi, Amar J., 4,414,117., Cl. 210-710.000.

Sundberg, Erik, to Waller Innovation AB. Wedge arrangement for locking together hammerhead and anvil. 4,413,686., Cl. 173-131.000.

Sung, Rodney L.: *See*—
Zoleski, Benjamin H.; and Sung, Rodney L., 4,414,123., Cl. 252-52.00A.

Sunmaster Corporation: *See*—
Dunlap, Glenn H.; and Zitkus, Wayne J., 4,413,617., Cl. 126-443.000.

Supraton F. J. Zucker GmbH: *See*—
Zucker, Friedrich J.; Osthaus, Georg; and Fisch, Klaus, 4,414,330., Cl. 340-767.000.

Suste, Joseph T., to Interstate Electronics Corp. Constant data rate brightness control for an AC plasma panel. 4,414,544., Cl. 340-767.000.

Suto, Shoichi; Suda, Hiroyuki; Hanawa, Fumiaki; Nakahara, Motohiro; and Inagaki, Nobuo, to Nippon Telegraph & Telephone Public Corporation. Fabrication methods of doped silica glass and optical fiber preform by using the doped silica glass. 4,414,012., Cl. 65-18.200.

Suzuki, Hajime; Masuda, Ikuo; and Kosaka, Masaki, to Daicel Ltd. Primer for powder coating comprising (a) diene polymer (b) MgO and (c) cobalt or manganese ion. 4,414,351., Cl. 524-413.000.

Suzuki, Hideo: *See*—
Tsuchimoto, Takamitsu; Kaneda, Saburo; Miyazawa, Tatsushi; Shimada, Toshio; Suzuki, Hideo; Sanagai, Mitsuru; and Hiraoka, Kaoru, 4,414,620., Cl. 364-200.000.

Suzuki, Isao: *See*—
Endo, Hiroshi; Awa, Masashi; Iiri, Shigeo; Oguchi, Toshihiko; Suzuki, Isao; Hirate, Naoyuki; and Hayashi, Masaru, 4,414,124., Cl. 252-62.630.

Suzuki, Kazutomi; Mikoshiba, Hitoshi; and Mitani, Yuji, to Teijin Limited. Selectively light-transmitting laminated structure. 4,413,877., Cl. 350-1.700.

Suzuki, Tadashi, to Satogosei Co., Ltd. Binding locker. 4,413,380., Cl. 24-16.0PB.

Suzuki, Yasoji; and Matsuo, Kenji, to Tokyo Shibaura Denki Kabushiki Kaisha. CR Oscillator having constant current charging source. 4,414,515., Cl. 331-111.000.

Suzuki, Yasuhiko: *See*—
Nishio, Kanemitsu; Takagi, Shunichi; and Suzuki, Yasuhiko, 4,414,483., Cl. 313-136.000.

Suzuki, Yoshio: *See*—
Yanagawa, Hajime; and Suzuki, Yoshio, 4,413,600., Cl. 123-449.000.

SW Industries, Inc.: *See*—
Maddox, Edward L.; and Pitts, Thomas E., 4,414,476., Cl. 250-563.000.

Swanson, Harold V., to GHA Lock Joint, Inc. Concrete comprising sulfur, cyclopentadiene oligomers, aggregate and glass fibers. 4,414,385., Cl. 524-494.000.

Swedo, Raymond J., to UOP Inc. Unsubstituted biphenylene as a cross-linking monomer. 4,414,380., Cl. 528-173.000.

Swedo, Raymond J.: *See*—
Malloy, Thomas P.; and Swedo, Raymond J., 4,414,120., Cl. 252-8.55D.

Swengel, Robert C., Jr., to AMP Incorporated. Earth connection connector having provision for an electrical component. 4,413,871., Cl. 339-14.00R.

Swinney, Dennis P., to Swinney Engineering Limited; and Lanso Products Limited. Press for the compression of loads. 4,413,555., Cl. 100-214.000.

Swinney Engineering Limited: *See*—
Swinney, Dennis P., 4,413,555., Cl. 100-214.000.

Swiss Fabricating, Inc.: *See*—
Lienhard, Robert W., Sr., 4,413,707., Cl. 182-150.000.

Sylvan R. Shemitz and Associates, Inc.: *See*—
Shemitz, Sylvan R., 4,414,609., Cl. 362-33.000.

Sylvan, Richard: *See*—
Ferdinand, Irwin J.; Sylvan, Richard; and Peterson, Michael, 4,413,374., Cl. 16-121.000.

Syntex (U.S.A.) Inc.: *See*—
Fu, Cherng-Chyi, 4,414,127., Cl. 252-95.000.

Szabo, Rene: *See*—
N'Guyen Duc, Xuong; and Szabo, Rene, 4,413,844., Cl. 285-16.000.

Szczepanek, Paul S.: *See*—
Berthold, John W., III; and Szczepanek, Paul S., 4,413,879., Cl. 350-96.190.

Szeker, George; and Shepherd, Charles G., to U.S. Philips Corporation. Mounting structure for a high pressure sodium lamp. 4,414,615., Cl. 362-264.000.

T. D. Williamson, Inc.: *See*—
Payne, Larry D.; Cho, Hyun J.; and Mehta, Kishor N., 4,413,370., Cl. 15-104.06R.

Tabatabaie-Alavi, Kamal; Choudhury, Abu N. M. M.; Gabriel, Nancy J. (Slater); and Fonstad, Clifton G., to United States of America, Navy. Low resistance ohmic contact. 4,414,076., Cl. 204-15.000.

Tadauchi, Kazuhiro; and Torii, Taketsugu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Power antenna control circuit used in vehicle. 4,414,551., Cl. 343-903.000.

Tadmor, Zehev: *See*—
Hold, Peter; and Tadmor, Zehev, 4,413,913., Cl. 366-75.000.

Taguchi, Kazufumi, to Aisin Seiki Kabushiki Kaisha. Buttonhole device for a zig-zag sewing machine. 4,413,576., Cl. 112-158.00B.

Tahara, Tetsuya: *See*—
Kawakita, Takeshi; Chihara, Yasuaki; Fukuda, Takemi; Setoguchi, Michihide; and Tahara, Tetsuya, 4,414,216., Cl. 424-251.000.

Taira, Akio, to Olympus Optical Co., Ltd. Focusing device for microscopes. 4,413,889., Cl. 350-501.000.

Takagi, Shunichi: *See*—
Nishio, Kanemitsu; Takagi, Shunichi; and Suzuki, Yasuhiko, 4,414,483., Cl. 313-136.000.

Takahashi, Akira: *See*—
Komatsubara, Masahiro; Kamimura, Tetsuro; Inanaga, Takugi; and Takahashi, Akira, 4,413,793., Cl. 242-68.000.
Ohta, Kenji; Takahashi, Akira; and Deguchi, Toshihisa, 4,414,650., Cl. 365-122.000.

Takahashi, Masao: *See*—
Takeuchi, Fumio; and Takahashi, Masao, 4,414,044., Cl. 149-2.000.

Takahashi, Shintaro: *See*—
Siga, Masao; Kirihara, Seishin; Kuriyama, Mitsuo; Yosioka, Takatoshi; Takahashi, Shintaro; and Yoshida, Takehiko, 4,414,024., Cl. 75-126.00C.

Takahashi, Yonosuke: *See*—
Wada, Minoru; Takahashi, Yonosuke; and Hasegawa, Eiichi, 4,414,273., Cl. 428-336.000.

Takano, Motoharu; and Hoshino, Minoru, to Q.P. Corporation. Apparatus for taking material to be treated into and out of high pressure tank. 4,413,977., Cl. 432-56.000.

Takasu, Yutaka: *See*—
Matsui, Fumio; and Takasu, Yutaka, 4,414,604., Cl. 361-385.000.

Takata, Tadahiko: *See*—
Watanabe, Hirosuke; and Takata, Tadahiko, 4,414,272., Cl. 428-331.000.

Takeda, Minoru: *See*—
Kureha, Takeshi; Kataoka, Teruo; Saeki, Taiichi; and Takeda, M²noru, 4,414,571., Cl. 358-158.000.

Takeda Riken Kogyo Kabushikikaisha: *See*—
Kimura, Kenji; Sugamori, Shigeru; Ishikawa, Kohji; and Narumi, Naoaki, 4,414,665., Cl. 371-21.000.

Takeichi, Toshio, to Sanyo Electric Co., Ltd. Flyback transformer. 4,414,578., Cl. 358-243.000.

Takeishi, Koichi: *See*—
Tonomura, Toshiya; Takeishi, Koichi; Shimada, Mitsuhiro; and Katto, Atsuyuki, 4,413,616., Cl. 126-443.000.

Takekoshi, Shukuko. Process for preparing instant macaronis. 4,414,235., Cl. 426-557.000.

Takeshita, Ritsuji: *See*—
Seki, Kunio; and Takeshita, Ritsuji, 4,414,514., Cl. 330-262.000.

Takeuchi, Fumio; and Takahashi, Masao, to Nippon Oil and Fats, Co., Ltd. Water-in-oil emulsion explosive composition. 4,414,044., Cl. 149-2.000.

Takeuchi, Hitoshi: *See*—
Shionoya, Hiroshi; Arai, Haruyoshi; Koyanagi, Nozomu; and Takeuchi, Hitoshi, 4,414,201., Cl. 424-88.000.

Talambiras, Robert P., to Dranetz Engineering Laboratories, Inc. Sampling network analyzer with stored correction of gain errors. 4,414,638., Cl. 364-571.000.

Talambiras, Robert P., to Dranetz Engineering Laboratories, Inc. Sampling network analyzer with sampling synchronization by means of phase-locked loop. 4,414,639., Cl. 364-602.000.

Talbert Manufacturing, Inc.: *See*—
Losh, Russell L., 4,413,836., Cl. 280-423.00B.

Tallant, James C., II; and Hettiger, James, to RCA Corporation. Manually gain presettable kinescope driver in an automatic kinescope bias control system. 4,414,577., Cl. 358-242.000.

Talon, Inc.: *See*—
Fisher, Harry M.; and Fisher, Stuart N., 4,413,398., Cl. 29-410.000.

Tamazawa, Kazaharu: *See*—
Iwanami, Masaru; Maeda, Tetsuya; Nagano, Yoshinobu; Fujimoto, Masaharu; Nagano, Noriaki; Yamazaki, Atsuki; Tamazawa, Kazaharu; Murase, Kiyoshi; and Shibanuma, Tadao, 4,414,153., Cl. 260-239.100.

Tamulis, Walter G. pH Monitor electrode electrolyte cartridge. 4,413,628., Cl. 128-635.000.

Tamura, Takeo; and Imai, Mamoru, to Nissan Motor Company Limited. Automotive vehicle parts and fitting structure therefor. 4,413,798., Cl. 248-27.100.

Tanahashi, Masao: *See*—
Otsuka, Kiyotaka; and Tanahashi, Masao, 4,413,410., Cl. 30-43.600.

Tanaka, Hirokazu: *See*—
Ikushima, Koichi; Tanaka, Hirokazu; Osamu, Ohe; Kino, Eiko; Kohsaka, Masanobu; Aoki, Hatsuo; Arakawa, Akira; and Imanaka, Hiroshi, 4,414,226., Cl. 424-279.000.

Tanaka, Nobuyoshi: *See*—
Kato, Yuzo; Ishihara, Shunichi; Sato, Yasushi; Tanaka, Nobuyoshi; Kawamura, Naoto; and Nakatsui, Hisashi, 4,414,581., Cl. 358-280.000.

Tanaka, Shuhei: *See*—
Yamamoto, Manabu; and Tanaka, Shuhei, 4,414,575., Cl. 358-227.000.

Tarcsay, Lajos; Baschang, Gerhard; Hartmann, Albert; and Stanek, Jaroslav, to Ciba-Geigy Corporation. Antibiotic preparations having increased effectiveness, processes for their manufacture and method for increasing the antibiotic action of antibiotics. 4,414,204., Cl. 424-177.000.

Taskinen, Martti P.: *See*—
Peuhkurinen, Eino J.; Linnanketo, Erkki J.; Farm, Kari M. U.; Kivisto, Tuomo V. J.; Koho, Tauno T.; Kinnunen, Seppo T.; and Taskinen, Martti P., 4,413,495., Cl. 72-196.000.

Tatsumi, Hideo: *See*—
Kanamaru, Hisanobu; Tatsumi, Hideo; Sayo, Kosaku; and Okabe, Moisei, 4,413,717., Cl. 192-84.00C.

Tayler, Gerald E., to International Business Machines Corporation. Method and apparatus for discarding data from a buffer after reading such data. 4,414,644., Cl. 364-900.000.

Taylor, Kevin D. Diaper with liquid retaining chamber. 4,413,996., Cl. 604-382.000.

Taylor, Raymond C.: *See*—
Young, Jerry W.; Eddy, William R.; and Taylor, Raymond C., 4,413,983., Cl. 493-30.000.

Taylor, Verner L.; Sprowls, Joseph B., III; and Ayer, James R., to Boorman, Robert G. Apparatus for and methods of identifying horses by scanning their chestnuts. 4,414,546., Cl. 340-825.300.

Taylor, William J., Jr. Drum magazine for carbines or the like. 4,413,546., Cl. 89-33.00D.

Tazuma, James J.: *See*—
Gloth, Richard E.; Tazuma, James J.; and Keck, Max H., 4,414,348., Cl. 524-255.000.

TDK Electronics Co., Ltd.: *See*—
Kawahara, Hiroshi; Azegami, Hitoshi; and Horigome, Eiji, 4,414,288., Cl. 428-694.000.
Shibata, Fujio; Hirabayashi, Kenji; and Mikura, Chihoto, 4,414,289., Cl. 428-695.000.

Techne Electronics Limited: *See*—
Ho, Eugene Y., 4,414,541., Cl. 340-566.000.

Technological University of Nagaoka: *See*—
Yamashita, Tsutomu; and Matsuda, Jimichi, 4,414,487., Cl. 315-5.000.

Tedesco, Joseph P.: *See*—
Woodruff, Richard K.; and Tedesco, Joseph P., 4,414,674., Cl. 373-130.000.

Teijin Limited: *See*—
Iwata, Kaoru; Nishihara, Toshio; Ohe, Michisuke; Saito, Yoichi; and Horike, Akihiro, 4,414,254., Cl. 428-34.000.
Kiriyama, Tsutomu; Norota, Susumu; Segawa, Yasuhiko; Emi, Shingo; Imoto, Tadasi; and Azumi, Toshinori, 4,414,276., Cl. 428-374.000.
Suzuki, Kazutomi; Mikoshiba, Hitoshi; and Mitani, Yuji, 4,413,877., Cl. 350-1.700.
Watanabe, Hirosuke; and Takata, Tadahiko, 4,414,272., Cl. 428-331.000.

Telecommunications Radioelectriques et Telephoniques T.R.T.: *See*—
Ferrieu, Gilbert M. M.; Osmond, Etienne J. R.; and Hetet, Yves J. F., 4,414,434., Cl. 179-77.000.

Teledyne Industries, Inc.: *See*—
McDonald, William K., 4,414,428., Cl. 174-126.00S.

Teletype Corporation: *See*—
Schnizlein, Paul G., 4,414,538., Cl. 340-365.00S.

Temkin, Henryk: *See*—
Keramidas, Vassilis G.; McCoy, Robert J.; and Temkin, Henryk, 4,414,561., Cl. 357-67.000.

Temple, David L., Jr.: *See*—
Poindexter, Graham S.; and Temple, David L., Jr., 4,414,213., Cl. 424-248.500.

Tenberg, Werner; and Pichert, Ludwig, to Mannesmann Aktiengesellschaft. Ascertaining the level of the slag-liquid-metal interface in metallurgical vessels. 4,413,810., Cl. 266-94.000.

Tenold, Tyrus N.; Cossette, Michael D.; Kuntz, James P.; and Gordon, Jack D., to Spokane Industries, Inc. Floating lid for a liquid storage tank. 4,413,747., Cl. 220-225.000.

Tenud, Leander: *See*—
Miller, Raimund; and Tenud, Leander, 4,414,400., Cl. 549-313.000.

Terneu, Robert: *See*—
Van Laethem, Robert; and Terneu, Robert, 4,414,015., Cl. 65-60.300.

Teroson GmbH: *See*—
Reich, Karl; and Sieger, Heinz, 4,414,347., Cl. 524-168.000.

Terrien, Michel E.; and Bouvet, Claude, to Etat Francais. Automatic device for lap-joint engagement of two bridge elements on intrados or extrados and bridge element comprising it. 4,413,369., Cl. 14-27.000.

Teshima, Toru: *See*—
Nishizawa, Jun-ichi; and Teshima, Toru, 4,414,558., Cl. 357-17.000.

Texaco Development Corporation: *See*—
Gillespie, Ronald G., 4,413,678., Cl. 166-57.000.

Texaco Inc.: *See*—
Lin, Jiang-Jen; and Knifton, John F., 4,414,410., Cl. 560-265.000.
Petty, Randall H.; and Bartley, Burton H., 4,414,138., Cl. 502-73.000.
Powell, Justin C., 4,414,397., Cl. 549-255.000.
Zoleski, Benjamin H.; and Sung, Rodney L., 4,414,123., Cl. 252-52.00A.

Texaco Puerto Rico Inc.: *See*—
Olivieri, Edgar S., 4,413,503., Cl. 73-40.700.

Texas Instruments Incorporated: *See*—
Bouffard, Michael L.; and Pejouhy, Radi, 4,414,530., Cl. 338-25.000.
Doherty, John, Jr., 4,414,524., Cl. 337-87.000.
Ty, Henry, 4,414,286., Cl. 428-616.000.

Thaler, Barry J.: *See*—
McCusker, Joseph H.; Thaler, Barry J.; and Tsien, Wei H., 4,413,510., Cl. 73-150.00A.

The, Paul J., to Aluminum Company of America. Removal of copper and zinc species from Bayer process liquor by filtration. 4,414,115., Cl. 210-665.000.

Theilen, Dennis R.: *See—*
Ostrom, Carl R.; and Theilen, Dennis R., 4,413,783., Cl. 239-183.000.

Theiler, Richard F.: *See—*
Sleeth, Rhule B.; Theiler, Richard F.; and Rendek, Robert B., 4,414,232., Cl. 426-266.000.

Thermal Associates, Inc.: *See—*
Kiley, Richard F.; and Larson, Ralph I., 4,414,562., Cl. 357-81.000.

Thermal Designs, Inc.: *See—*
Hune, R. G., 4,413,683., Cl. 169-48.000.

Thiele, Horst: *See—*
Landwehr, Gunter; and Thiele, Horst, 4,413,582., Cl. 112-311.000.

Thiele, Karl-Heinz: *See—*
Trauernicht, Herbert; and Thiele, Karl-Heinz, 4,414,437., Cl. 179-115.5VC.

Thiokol Corporation: *See—*
Bliss, William R., 4,413,968., Cl. 425-198.000.

Thirion, Andre, to Antivols Simplex. Anti-theft device for the steering column of an automobile. 4,413,491., Cl. 70-252.000.

Thirlwall, Alan C.: *See—*
Ive, John G. S.; and Thirlwall, Alan C., 4,414,677., Cl. 375-116.000.

Thirouard, Michel: *See—*
Arquie, Louis; and Thirouard, Michel, 4,414,657., Cl. 369-45.000.

Thoma, Martin, to Motoren-und Turbinen-Union Munchen GmbH. Method of activating titanium surfaces. 4,414,039., Cl. 148-6.200.

Thomas Industries Inc.: *See—*
Henrich, William H., 4,414,493., Cl. 315-308.000.

Thomas, Robert D., to Smith International, Inc. Thrust bearing for rock bits. 4,413,918., Cl. 384-95.000.

Thomas, William S. Portable beverage cooler. 4,413,481., Cl. 62-371.000.

Thomason, Robert L.: *See—*
Peyton, John J.; Thomason, Robert L.; and Evinger, Hubert W., 4,414,566., Cl. 358-101.000.

Thompson, Martin K.: *See—*
Nield, Eric; and Thompson, Martin K., 4,414,358., Cl. 524-538.000.

Thomson-CSF: *See—*
Arquie, Louis; and Thirouard, Michel, 4,414,657., Cl. 369-45.000.
Eranian, Armand; Dubois, Jean-Claude; Gazard, Maryse; and Barre, Francoise, 4,414,081., Cl. 204-159.180.
Hareng, Michel; Huignard, Jean-Pierre; and Le Berre, Serge, 4,413,885., Cl. 350-342.000.

Thomson, William J.: *See—*
Hall, Robert N.; Carlson, Franklin B.; and Thomson, William J., 4,413,573., Cl. 110-347.000.

Thorn Domestic Appliances (Electrical) Ltd.: *See—*
Newton, Stephen J.; and Patel, Abdul H., 4,414,465., Cl. 219-449.000.

Thorogood, Robert M., to International Coal Refining Company. Solvent refined coal reactor quench system. 4,414,094., Cl. 208-8.0LE.

Thorsteinson, Erlind M.: *See—*
Decker, Harry J.; and Thorsteinson, Erlind M., 4,414,411., Cl. 562-534.000.

Thummel, Rudolph C.; Fischer, Hanspeter; and Maier, Ludwig, to Ciba-Geigy Corporation. Phosphonomethylglycylhydroxamic acid and novel herbicidally active salts thereof. 4,414,158., Cl. 260-438.100.

Tietjen, Marlene: *See—*
Fotiu, Eustace; Tietjen, Marlene; Goldner, Tibor; and Rosenblum, Philip, 4,413,921., Cl. 401-96.000.

Tilton, Richard A.: *See—*
Wells, William E., Jr.; Marcum, S. Douglas; Downes, Lawrence W.; and Tilton, Richard A., 4,414,671., Cl. 372-73.000.

Timberlake, John R.; Ruzic, David N.; Moore, Richard L.; Cohen, Samuel A.; and Manos, Dennis M. Surface modification to waveguides. 4,414,244., Cl. 427-105.000.

Timex Corporation: *See—*
Pomponio, Edward V., 4,414,439., Cl. 200-38.00R.
Sethofer, Nicholas L.; and Harper, Michael C., 4,414,131., Cl. 252-299.100.

Ting, Raymond M. L. Building wall liner assembly. 4,413,458., Cl. 52-481.000.

Tiret, Bernard: *See—*
Cornu, Jean; Detriche, Jean-Marie; Tiret, Bernard; Jorge, Gerard; Galera, Richard; Biava, Dominique; and Marchal, Paul, 4,413,910., Cl. 356-377.000.

Tisdale, Reynold D. Portable Hibachi-type charcoal grill with kindling structure. 4,413,609., Cl. 126-25.00R.

Toa Medical Electronic Co., Ltd.: *See—*
Iwata, Toyotaro; Nakajima, Kunio; and Otsuki, Hiroyuki, 4,414,073., Cl. 204-299.00R.

Tobias, Michael A., to Mobil Oil Corporation. Acrylic modified anionic water dispersible styrene allyl alcohol copolymers. 4,414,283., Cl. 428-461.000.

Toda, Toshiaki: *See—*
Yoshioka, Hideoki; Okino, Ichiro; and Toda, Toshiaki, 4,414,529., Cl. 337-365.000.

Tokarz, Richard D. Liquid level, void fraction, and superheated steam sensor for nuclear reactor cores. 4,414,177., Cl. 376-247.000.

Tokorozawa, Sadao, to Pilot Man-Nen-Hitsu Kabushiki Kaisha. Method for dispensing a preselected amount of liquid. 4,413,751., Cl. 222-1.000.

Tokuda, Kazuo; and Sawataishi, Tokio, to Nippon Electric Co., Ltd. Transistor circuit. 4,414,569., Cl. 358-153.000.

Tokura, Isao: *See—*
Ueda, Sadao; Tokura, Isao; and Yamada, Mitsuhiko, 4,414,636., Cl. 364-526.000.

Tokuyama, Mitsuru; Tsuchiya, Yoshimi; Kawaguchi, Hikotaro; Sagae, Masayuki; and Ohki, Kenji, to Kao Soap Co., Ltd. Water absorbing sheet assembly. 4,414,255., Cl. 428-154.000.

Tokyo Kogaku Kikai Kabushiki Kaisha: *See—*
Hamada, Toshio; and Ohtomo, Fumio, 4,413,904., Cl. 356-5.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Arai, Michio; Shiraogawa, Yukio; Sakamoto, Tsutomu; and Aoyagi, Keizo, 4,414,626., Cl. 364-200.000.
Ariizumi, Shoji, 4,413,403., Cl. 29-571.000.
Doke, Hiroshi; Itomi, Kazunobu; and Ishihara, Kenshi, 4,413,405., Cl. 29-596.000.
Endo, Hiroshi; Awa, Masashi; Iiri, Shigeo; Oguchi, Toshihiko; Suzuki, Isao; Hirate, Naoyuki; and Hayashi, Masaru, 4,414,124., Cl. 252-62.630.
Igarashi, Yukio, 4,414,559., Cl. 357-38.000.
Kobayashi, Sumio, 4,414,599., Cl. 361-56.000.
Kohyama, Mitsuaki, 4,413,897., Cl. 355-3.0CH.
Matsuzaka, Takashi; Ohtsuki, Toshio; Komori, Minoru; and Sakuma, Tsutomu, 4,414,139., Cl. 502-72.000.
Mizoguchi, Tetsuhiko; and Koyama, Akio, 4,414,424., Cl. 174-28.000.
Seimiya, Motoo; and Nishida, Katsutoshi, 4,414,190., Cl. 423-344.000.
Sudo, Shigeru; and Yada, Masaaki, 4,414,460., Cl. 219-121.0LD.
Sumi, Masahiko, 4,414,536., Cl. 340-347.0DD.
Suzuki, Yasoji; and Matsuo, Kenji, 4,414,515., Cl. 331-111.000.

Tomashauser, Josef: *See—*
Buchholz, Rainer; Tomashauser, Josef; Zodrow, Rudolf; and Mohn, Hans-Werner, 4,414,056., Cl. 156-476.000.

Tominaga, Michiaki; Yung-hsiung, Yang; Ogawa, Hidenori; and Nakagawa, Kazuyuki, to Otsuka, Pharmaceutical Co., Ltd. Carbostyril compounds and compositions containing same. 4,414,390., Cl. 546-121.000.

Tomlinson, Samuel J., Sr.; Dean, Edward E.; and Adams, Leon M., to Southwest Research Institute. Method for repelling birds, especially woodpeckers. 4,414,227., Cl. 424-331.000.

Tomoff, Toma; Mohr, Hans G.; and Kempf, Volker, to Bodenseewerk Perkin-Elmer & Co., GmbH. Sample transport mechanism. 4,413,534., Cl. 73-864.210.

Tomori, Yasumasa, to Asahi Kogaku Kogyo Kabushiki Kaisha. Interchangeable lens barrel. 4,413,893., Cl. 354-195.000.

Tonomura, Toshiya; Takeishi, Koichi; Shimada, Mitsuhiro; and Katto, Atsuyuki, to Sharp Kabushiki Kaisha. Solar heat collector assembly. 4,413,616., Cl. 126-443.000.

Tools & Machinery Builders, Inc.: *See—*
Cook, Ronald, 4,413,587., Cl. 118-210.000.

Torii, Taketsugu: *See—*
Tadauchi, Kazuhiro; and Torii, Taketsugu, 4,414,551., Cl. 343-903.000.

Tosco Corporation: *See—*
Hall, Robert N.; Carlson, Franklin B.; and Thomson, William J., 4,413,573., Cl. 110-347.000.

Total Shooting Systems, Inc.: *See—*
Michael, Bayard H., 4,413,706., Cl. 182-91.000.

Toyo Kohan Company, Limited: *See—*
Shimizu, Nobuyoshi; Saijo, Kinji; Hizuka, Kenji; Inui, Tsuneo; and Kondo, Yoshikazu, 4,414,078., Cl. 204-34.000.

Toyo Soda Manufacturing Co., Ltd.: *See—*
Watanabe, Hiroyuki, 4,414,065., Cl. 204-81.000.

Toyoda, Hideaki, to Komori Printing Machinery Co., Ltd. Ink fountain devices for printing press. 4,413,561., Cl. 101-365.000.

Toyota Jidosha Kabushiki Kaisha: *See—*
Hirayama, Tsutomu, 4,413,596., Cl. 123-41.100.
Kumagai, Tadanobu, 4,413,701., Cl. 180-256.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Hattori, Kyo; Shibata, Noriyoshi; and Hagino, Isamu, 4,413,471., Cl. 60-276.000.
Ii, Akira; Sasano, Haitunori; Morishita, Michio; Kuno, Mikio; and Kadowaki, Kunio, 4,414,162., Cl. 261-23.00A.
Matsuoka, Hiroki; Kinugasa, Yukio; and Yaegashi, Takehisa, 4,413,601., Cl. 123-480.000.
Sasaki, Hiroaki; Inoue, Testuya; Mineo, Yoshiharu; Iguchi, Sei; Makita, Kazuhide; Arai, Hiroshi; Itoh, Hajime; Ohta, Hisatoshi; Inazu, Masahiro; and Kawahashi, Akira, 4,413,424., Cl. 33-361.000.
Shigematsu, Takashi; Watanabe, Tomoyuki; and Sawada, Daisaku, 4,413,599., Cl. 123-425.000.
Tadauchi, Kazuhiro; and Torii, Taketsugu, 4,414,551., Cl. 343-903.000.

Toyotomi Kogyo Co., Ltd.: *See—*
Nakamura, Kazuharu; Matsumoto, Motoki; Tsuboi, Yoshimasa; Kondo, Akinobu; and Kataoka, Yoshitaka. 4,413,612., Cl. 126-92.00C.

Tracy, Fred L. Method and apparatus for in situ repair of a worn pipe section. 4,413,765., Cl. 228-119.000.

Trancom AB: *See—*
Karlstrom, Krister, 4,414,661., Cl. 370-95.000.

Trane Company, The: *See—*
Butterworth, Arthur L., 4,413,959., Cl. 418-14.000.

Trapasso, Louis E.: *See*—
Costanza, John R.; and Trapasso, Louis E., 4,414,250., Cl. 427-386.000.
Trauernicht, Herbert; and Thiele, Karl-Heinz, to Licentia Patent-Verwaltungs-GmbH. Moving coil dynamic transducer. 4,414,437., Cl. 179-115.5VC.
Tresselt, Carl P., to Bendix Corporation, The. Low profile circular array antenna and microstrip elements therefor. 4,414,550., Cl. 343-700.0MS.
Trio Kabushiki Kaisha: *See*—
Kato, Harumitsu; Yamada, Hironori; Yamazaki, Kaoru; Maruyama, Masashi; and Ogasawara, Takashi, 4,413,703., Cl. 181-156.000.
Kurata, Hirotaka, 4,414,584., Cl. 358-342.000.
Troiano, Joseph. Portable shower system. 4,413,363., Cl. 4-599.000.
Trotta, Robert A., to Gillette Company, The. Razor handle. 4,413,411., Cl. 30-85.000.
Troup, Diana C.: *See*—
Hunter, Gary L.; Marason, Gabriel, Jr.; and Troup, Diana C., 4,413,441., Cl. 46-116.000.
Trout, Donald M. Spring-stretch-reducing window sash balance. 4,413,445., Cl. 49-445.000.
Trufitt, Alton D.; and Bringman, David J., to Australian Paper Manufacturers Limited; and Beloit Corporation. Twin wire paper forming apparatus. 4,414,061., Cl. 162-295.000.
Trustroke International, Inc.: *See*—
Miller, Gardner H., 4,413,826., Cl. 273-186.00C.
TRW Inc.: *See*—
Carpenter, Daniel D.; and Lanning, Ronald L., 4,414,548., Cl. 343-8.000.
Lubowitz, Hyman R.; and Sheppard, Clyde H., 4,414,269., Cl. 428-290.000.
Tsien, Wei H.: *See*—
McCusker, Joseph H.; Thaler, Barry J.; and Tsien, Wei H., 4,413,510., Cl. 73-150.00A.
Tsuboi, Yoshimasa: *See*—
Nakamura, Kazuharu; Matsumoto, Motoki; Tsuboi, Yoshimasa; Kondo, Akinobu; and Kataoka, Yoshitaka, 4,413,612., Cl. 126-92.00C.
Tsuchimoto, Takamitsu; Kaneda, Saburo; Miyazawa, Tatsushi; Shimada, Toshio; Suzuki, Hideo; Sanagai, Mitsuru; and Hiraoka, Kaoru, to Fujitsu Limited. Inter-subsystem communication system. 4,414,620., Cl. 364-200.000.
Tsuchiya, Hiroshi; Yamahira, Hitoshi; and Murakami, Takeshi, to Kanzaki Paper Manufacturing Co., Ltd. Heat-sensitive record material. 4,414,259., Cl. 428-207.000.
Tsuchiya, Yoshimi: *See*—
Tokuyama, Mitsuru; Tsuchiya, Yoshimi; Kawaguchi, Hikotaro; Sagae, Masayuki; and Ohki, Kenji, 4,414,255., Cl. 428-154.000.
Tsushima, Shuichi: *See*—
Karasawa, Shuichi; Matsumoto, Fuyuhiko; Tsushima, Shuichi; Saitou, Masatoshi; Ishida, Tsutomu; Ikeda, Kunihiko; Yoshikawa, Masao; and Sato, Tsutomu, 4,413,899., Cl. 355-4.000.
Tsutaki, Kunio; and Kageyama, Takao, to Nippon Electric Co., Ltd. Coupled cavity type traveling wave tube. 4,414,486., Cl. 315-3.600.
Tsutsumi, Saburo, to Nissan Motor Co., Ltd. Intake control device for automotive internal combustion engine. 4,413,598., Cl. 123-306.000.
Tucker, Michael C. Reinforcing and confining earth formation. 4,413,928., Cl. 405-260.000.
Tucker, Samuel M., to Kendall Company, The. Abdominal restraint system. 4,413,620., Cl. 128-134.000.
Tucker, Wayne R. Two-wheel hand truck. 4,413,833., Cl. 280-47.220.
Tuggle, Lloyd H.; and Loyd, Ronald C., to Emerson Electric Co. Blower attachment for portable power unit. 4,413,371., Cl. 15-405.000.
Tulon, Inc.: *See*—
Weideman, Allen T., 4,413,731., Cl. 206-379.000.
Tune, Herbert E., to Star Engineering Applications Limited. Fuel blending installation. 4,413,604., Cl. 123-515.000.
Tungum Hydraulics Limited: *See*—
Lawrence, Anthony J., 4,413,845., Cl. 285-23.000.
Turnbull, Michael: *See*—
Cartwright, David; and Turnbull, Michael, 4,414,391., Cl. 546-302.000.
Turner, Jesse H.; and Wallace, Elmer E., to Essex Group, Inc. Combination control with high/low pilot gas flow. 4,413,975., Cl. 431-56.000.
Turner, R. Brough: *See*—
Abrams, David E.; Curbelo, Raul; and Turner, R. Brough, 4,413,908., Cl. 356-346.000.
Ty, Henry, to Texas Instruments Incorporated. Composite thermostat metal. 4,414,286., Cl. 428-616.000.
Uba, Toshio, to Gates Energy Products, Inc. Battery separator. 4,414,295., Cl. 429-59.000.
Uchimi, Takashi: *See*—
Hirota, Akira; Hiraguri, Seisuke; and Uchimi, Takashi, 4,414,586., Cl. 360-70.000.
Ueda, Akio: *See*—
Akita, Shuichi; Chida, Takeshi; Watanabe, Hiroyuki; and Ueda, Akio, 4,414,363., Cl. 525-237.000.
Ueda, Kenji; and Miyamoto, Kiyoshi, to Omron Tateisi Electronics Co. Electronic switching device. 4,414,478., Cl. 307-116.000.
Ueda, Sadao; Tokura, Isao; and Yamada, Mitsuhiko, to Dainippon Screen Seizo Kabushiki Kaisha. Color control simulator for a picture reproducing machine. 4,414,636., Cl. 364-526.000.
Ueno, Katsuji: *See*—
Hanabata, Makoto; Maruyama, Takashi; and Ueno, Katsuji, 4,414,230., Cl. 426-106.000.
Uggeri, Fulvio: *See*—
Giordano, Claudio; Belli, Aldo; Uggeri, Fulvio; and Villa, Giovanni, 4,414,405., Cl. 560-56.000.
Ulion, Nicholas E.; and Ruckle, Duane L., to United Technologies Corporation. Method for producing metallic articles having durable ceramic thermal barrier coatings. 4,414,249., Cl. 427-248.100.
Ullman, Myron E.: *See*—
Kessler, Milton; and Ullman, Myron E., 4,413,748., Cl. 220-281.000.
Union Camp Corporation: *See*—
Olechowski, Jerome R.; and Lawson, Nelson E., 4,414,146., Cl. 260-97.000.
Union Carbide Corporation: *See*—
Decker, Harry J.; and Thorsteinson, Erlind M., 4,414,411., Cl. 562-534.000.
Fuderer, Andrija, 4,414,191., Cl. 423-359.000.
Gardner, Hugh C., 4,414,367., Cl. 525-531.000.
Pinkston, Bruce H. W., 4,414,184., Cl. 422-133.000.
Schilling, Curtis L., Jr.; Williams, Thomas C.; and Wesson, John P., 4,414,403., Cl. 556-430.000.
Union Oil Company of California: *See*—
Delaney, Dennis D.; and Fenton, Donald M., 4,414,104., Cl. 208-251.00R.
Sandiford, Burton B.; Dovan, Hoai T.; and Hutchins, Richard D., 4,413,680., Cl. 166-270.000.
Young, Dean A.; and Koepke, Jeffery W., 4,414,137., Cl. 502-162.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Cuckson, Harry; and Curtis, Peter D., 4,414,505., Cl. 324-85.000.
Lettington, Alan H., 4,413,878., Cl. 350-6.700.
Shanks, Ian A., 4,414,565., Cl. 358-89.000.
United States of America
Agriculture: *See*—
Milligan, Brian; Buechler, Peter R.; and Feairheller, Stephen H., 4,413,997., Cl. 8-94.210.
Ward, Truman L.; and Benerito, Ruth R., 4,414,084., Cl. 204-165.000.
Air Force: *See*—
Limpaecher, Rudolf, 4,414,670., Cl. 372-58.000.
Army: *See*—
Loeb, Alfred A.; and Salamon, Robert G., 4,413,566., Cl. 102-517.000.
Novak, Thaddeus J., 4,414,414., Cl. 564-271.000.
Energy: *See*—
Krauss, Alan R.; and Gruen, Dieter M., 4,414,176., Cl. 376-136.000.
Health and Human Services: *See*—
Ito, Yoichiro, 4,414,108., Cl. 210-198.200.
Health & Human Services: *See*—
Wellner, Edward; Michejda, Maria; and Hodgen, Gary D., 4,413,985., Cl. 604-9.000.
National Aeronautics and Space Administration: *See*—
Dea, Jack Y., 4,413,784., Cl. 239-426.000.
Leatherwood, Jack D.; Dempsey, Thomas K.; Clevenson, Sherman A.; and Stephens, David G., 4,413,522., Cl. 73-646.000.
Singh, Jag J.; Wood, George M., Jr.; Rayborn, Grayson H.; and White, Frederick A., 4,414,509., Cl. 324-250.000.
Williams, Roger M.; and Rembaum, Alan, 4,414,080., Cl. 204-129.000.
National Security Agency: *See*—
Berthold, John W., III; and Szczepanek, Paul S., 4,413,879., Cl. 350-96.190.
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U.S. Philips Corporation: *See*—
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Urso, Charles J., Jr.: *See—*
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Uskokovic, Milan R.; and Wovkulich, Peter M., to Hoffmann-La Roche Inc. [2S-(2β,2S*, 3β)]-3-Aminotetrahydro-5-methoxy-α-methyl-2-furanmethanol, an intermediate in the chiral synthesis of amino sugars. 4,414,402., Cl. 549-475.000.

USM Corporation: *See—*
Hold, Peter; and Tadmor, Zehev, 4,413,913., Cl. 366-75.000.

Utilux Pty. Ltd.: *See—*
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Vallod, Joseph: *See—*
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Geel, Zane H.; Hornby, Roger B.; Lipps, Bennie J.; Savage, Charles E.; and Vanat, Pierre, 4,414,110., Cl. 210-321.300.

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van den Bosch, Steven; van't Land, Evert; and Stoffelsma, Jan, to Polak's Frutal Works, B.V. Methylthiomethyl esters as flavor additives. 4,414,233., Cl. 426-535.000.

van der Nat, Adrianus A.: *See—*
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VanDril, William A., to Whiting Corporation. Water-cooled, liningless cupola. 4,413,811., Cl. 266-190.000.

Van Gestel, Wilhelmus J., to U.S. Philips Corporation. Method of transmitting an audio signal via a transmission channel. 4,414,585., Cl. 360-40.000.

Van Kemenade, Martinus J. C., to U.S. Philips Corporation. Apparatus for examining an object by means of ultrasonic waves. 4,413,521., Cl. 73-626.000.

Van Laethem, Robert; and Terneu, Robert, to BFG Glassgroup. Process and apparatus for forming a metal or metal compound coating. 4,414,015., Cl. 65-60.300.

Vansant, Etienne F.: *See—*
De Bievre, Paul J.; Vansant, Etienne F.; and Peeters, Guido J., 4,414,005., Cl. 55-75.000.

Van Scoy, Davis A., to Grove Valve and Regulator Company. Orifice meter with isolation valve on the carrier. 4,413,532., Cl. 73-861.610.

van't Land, Evert: *See—*
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Van Willigen, Durk: *See—*
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Varian Associates, Inc.: *See—*
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Varterasian, John H.; Plack, Albert R.; and Melichar, Jackson W., to General Motors Corporation. Passenger restraint system. 4,413,838., Cl. 280-751.000.

Vasalos, Iacovos A.: *See—*
Smith, Jeffrey S.; Quinn, George P.; and Vasalos, Iacovos A., 4,414,101., Cl. 208-153.000.

Vaughn, Howard A., Jr.; and Ching, Ta-Yen, to General Electric Company. Silicone resin coating composition adapted for primerless adhesion to plastic substrates and process for making same. 4,414,349., Cl. 524-261.000.

Veb Schwermaschinenbau Kombinat "Ernst Thalmann"Magdeburg: *See—*
Weinhold, Harri; Vogel, Heinz-Rudiger; Kurze, Bernhard; Schlegel, Joachim; Rauschenbach, Dieter; Hering, Roland; Werner, Peter; and Wunsch, Heinz, 4,413,585., Cl. 118-61.000.

Venuso, Nicholas A., to Metropolitan Sanitary District of Greater Chicago. Method and apparatus for remote measuring. 4,413,419., Cl. 33-174.00G.

Verbatim Corporation: *See—*
Song, Hubert, 4,414,497., Cl. 318-696.000.

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Verlinden, Harry W., to Electrohome Limited. Video amplifier with blank stretching. 4,414,574., Cl. 358-184.000.

Verosol B.V.: *See—*
Istha, Johannis, 4,413,664., Cl. 160-178.00C.

Vicon Industries, Inc.: *See—*
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Victor Company of Japan, Ltd.: *See—*
Hirota, Akira; Hiraguri, Seisuke; and Uchimi, Takashi, 4,414,586., Cl. 360-70.000.
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Video Corporation of America: *See—*
Gould, George K.; and Steinberg, Eric, 4,414,467., Cl. 235-381.000.

Vilargunte, Valentin S. Warp and weft weaving machine. 4,413,658., Cl. 139-436.000.

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Giordano, Claudio; Belli, Aldo; Uggeri, Fulvio; and Villa, Giovanni, 4,414,405., Cl. 560-56.000.

Villalobos, Joseph A.; and Psyhojos, Triffin G., to AER Corporation. Fuel control system for dryer. 4,413,427., Cl. 34-46.000.

Vincent, Sheridan E.: *See—*
Kapecki, Jon A.; Gormel, Thomas M.; and Vincent, Sheridan E., 4,414,307., Cl. 430-465.000.

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Vodrazka, Wolfgang: *See—*
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Voermans, Antonius B.: *See—*
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Voest-Alpine Aktiengesellschaft: *See—*
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Lugscheider, Walter; and Riegler, Ernst, 4,414,673., Cl. 373-22.000.

Vogel, F. Lincoln; and Zeller, Claude. Organic matrix composites reinforced with intercalated graphite. 4,414,142., Cl. 252-506.000.

Vogel, Heinz-Rudiger: *See—*
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Voigtman, Edward G.; Winefordner, James D.; and Jurgensen, Arthur R., to University of Florida. Liquid-phase chromatography detector. 4,413,504., Cl. 73-61.10C.

Volkamer, Klaus: *See—*
Wagner, Eckhart; Wagner, Ulrich; Volkamer, Klaus; and Vodrazka, Wolfgang, 4,414,004., Cl. 55-48.000.

Volz, Hans: *See—*
Lauckner, Joachim; Lutz, Felix; Seibold, Gerhard; Wessel, Gerhard; and Volz, Hans, 4,413,886., Cl. 350-392.000.

von der Eltz, Hans-Ulrich; Heinisch, Peter; and Ballmann, Hans J., to Hoechst AG. Process for the continuous or semicontinuous dyeing of

voluminous cellulose fabrics with azo developing dyestuffs using acrylamide polymers. 4,414,000., Cl. 8-555.000.

Wada, Fumio: *See*—
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Wada, Minoru; Takahashi, Yonosuke; and Hasegawa, Eiichi, to Fuji Photo Film Co., Ltd. Thermal recording materials. 4,414,273., Cl. 428-336.000.

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Wade, Charles E., Jr.; and Rapp, Fred J. Ribbon type dating equipment. 4,413,557., Cl. 101-44.000.

Wagner, Eckhart; Wagner, Ulrich; Volkamer, Klaus; and Vodrazka, Wolfgang, to BASF Aktiengesellschaft. Removal of condensable aliphatic hydrocarbons and acidic gases from natural gas. 4,414,004., Cl. 55-48.000.

Wagner, Ulrich: *See*—
Wagner, Eckhart; Wagner, Ulrich; Volkamer, Klaus; and Vodrazka, Wolfgang, 4,414,004., Cl. 55-48.000.

Wahle, Gunter; and Rudszinat, Willy, to Hauni-Werke Korber & Co. KG. Apparatus for transporting rod-shaped articles of the tobacco processing industry. 4,413,640., Cl. 131-281.000.

Wainwright, Clyde: *See*—
Callihan, Rudy B.; and Wainwright, Clyde, 4,413,682., Cl. 166-382.000.

Waite, John H. Method and apparatus for making correlations and predictions using a finite field of data of unorganized and/or partially structured elements. 4,414,629., Cl. 364-300.000.

Waits, Charles G.; Nicholas, Karl W.; and Bushman, James B., to Harco Corporation. Low resistance, fluid replenishing, reference cell and method for using same in structure-to-soil electrical surveys. 4,414,511., Cl. 324-347.000.

Waldstrom, Ejvind, to O. G. Hoyer A/S. Apparatus for shaping frozen confections. 4,413,461., Cl. 53-122.000.

Walenciak, Kenneth J.: *See*—
DiMaggio, Joseph P., Jr.; Eng, Henry; Ball, Donald A.; and Walenciak, Kenneth J., 4,413,584., Cl. 118-56.000.

Wallace, Elmer E.: *See*—
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Wallace Murray Corporation: *See*—
Mills, Walter H.; and Bilbrey, Joseph T., Sr., 4,413,966., Cl. 425-84.000.

Wallace, William K.; Giardino, David A.; and Groshans, Joseph R., to Chicago Pneumatic Tool Company. Microprocessor control yield point tightening system. 4,413,396., Cl. 29-407.000.

Wallander, Carl-Otto, to Hydropress Wallander & Co. AB. Refuse compacting device. 4,413,554., Cl. 100-43.000.

Waller, Francis J., to Du Pont de Nemours, E. I., and Company. Palladium sulfonate catalyst systems for carbonylation of olefins. 4,414,409., Cl. 560-233.000.

Waller Innovation AB: *See*—
Sundberg, Erik, 4,413,686., Cl. 173-131.000.

Walloch, Richard G., to Falk Corporation, The. Flexible grid coupling. 4,413,980., Cl. 464-82.000.

Walls, John E.; and Dunder, Thomas A., to American Hoechst Corporation. Cathodic deposition of light sensitive components. 4,414,311., Cl. 430-157.000.

Walter, John: *See*—
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Walters, Armon J. Complete air-flow dispensers. 4,413,758., Cl. 222-195.000.

Walters, Ronald B.; and Hammond, Anthony G., to Sperry Limited. Hydraulic valves. 4,413,648., Cl. 137-486.000.

Wambach, Allen D.: *See*—
Cohen, Stuart C.; Kostelnik, Robert J.; and Wambach, Allen D., 4,414,352., Cl. 524-443.000.

Wang, Chih C.; and Bates, Ronald F., to RCA Corporation. High density information disc. 4,414,660., Cl. 369-286.000.

Wang, Kenneth Y.; Hill, Berlie R.; and Pinson, Marvin J., Jr., to Burlington Industries, Inc. High speed ultrasonic bonding. 4,414,045., Cl. 156-73.200.

Wanner, Heinz: *See*—
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Warabi, Junichi: *See*—
Kashimoto, Yutaka; Sakuma, Shinzo; Warabi, Junichi; Kobari, Yukio; and Kawaguchi, Hidemi, 4,414,448., Cl. 200-144.00B.

Ward, Michael L.; and Spector, George. Aquarium with simulated stream flow. 4,413,436., Cl. 40-160.000.

Ward, Truman L.; and Benerito, Ruth R., to United States of America, Agriculture. Process for conversion of cellulose to amino acids by radiofrequency plasma of nitrogen and hydrogen. 4,414,084., Cl. 204-165.000.

Warner Lambert Technologies, Inc.: *See*—
Rybicki, Edward B., 4,413,891., Cl. 351-235.000.
Siegmund, Walter P., 4,414,009., Cl. 65-4.300.

Washida, Akira; and Nakauchi, Yuji, to Kabushiki Kaisha Arai Seisakusho. Face seal with elastomeric axial thrust member. 4,413,831., Cl. 277-40.000.

Watanabe, Hirosuke; and Takata, Tadahiko, to Teijin Limited. Shaped polyester composite material having activated surface thereof and process for producing the same. 4,414,272., Cl. 428-331.900.

Watanabe, Hiroyuki, to Toyo Soda Manufacturing Co., Ltd. Method for preparing a chlorinated vinyl aromatic polymer. 4,414,065., Cl. 204-81.000.

Watanabe, Hiroyuki: *See*—
Akita, Shuichi; Chida, Takeshi; Watanabe, Hiroyuki; and Ueda, Akio, 4,414,363., Cl. 525-237.000.

Watanabe, Ichiro; Satoh, Yoshiaki; and Yamaguchi, Yasumasa, to Nitto Chemical Industry Co., Ltd. Process for producing a highly concentrated aqueous acrylamide solution by means of microorganisms. 4,414,331., Cl. 435-129.000.

Watanabe, Ryozo; Kawasumi, Keiichi; Maeda, Shoichi; and Shoji, Takashi, to Green Cross Corporation, The. Method for preparing sample for use in endotoxin test. 4,414,336., Cl. 436-502.000.

Watanabe, Tomoyoshi; Hirayama, Takanobu; Yoshimura, Motokazu; Mizuno, Kenji; and Inukai, Yukio, to Brother Industries, Ltd. Electronic typewriter and its control apparatus. 4,414,496., Cl. 318-696.000.

Watanabe, Tomoyuki: *See*—
Shigematsu, Takashi; Watanabe, Tomoyuki; and Sawada, Daisaku, 4,413,599., Cl. 123-425.000.

Watson, Frank L.: *See*—
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Watt, John S., to Austalian Atomic Energy Commission. Method for determining the solids weight fraction of a slurry. 4,414,472., Cl. 250-359.100.

Weaver, Charles S.; Chadwick, Joseph H.; Yarborough, John M., Jr.; Brown, Floyd A.; and Burch, Donald J., to SRI International. Skew sensing for digital tape playback. 4,414,587., Cl. 360-76.000.

Webb, Alan D., to British Petroleum Company Limited, The. Apparatus for installation in wells. 4,413,958., Cl. 417-424.000.

Weber, Albrecht: *See*—
Schmidt, Martin; Kohler, Walter; Loch, Hans-Ulrich; and Weber, Albrecht, 4,414,186., Cl. 423-175.000.

Weber, Jurgen; Falk, Volker; and Kniep, Claus, to Ruhrchemie Aktiengesellschaft. Stabilization of aldehydes. 4,414,419., Cl. 568-421.000.

Weber, Kurt: *See*—
Mandl, Gerhard; Mondini, Giancarlo; Pietrini, Viktor; Weber, Kurt; and Wildbolz, Rudolf, 4,413,378., Cl. 19-258.000.

Weber, Wendelin; and Rosenthal, Manfred, to U. S. Philips Corporation. Guide for tractor feed for paper webs in office machine. 4,413,764., Cl. 226-170.000.

Webster, Harold F., to General Electric Company. Method of forming a conductor pattern including fine conductor runs on a ceramic substrate. 4,413,766., Cl. 228-123.000.

Wegner, Eugene H., to Phillips Petroleum Company. Biochemical conversions by yeast fermentation at high cell densities. 4,414,329., Cl. 435-68.000.

Weideman, Allen T., to Tulon, Inc. Packaging arrangement for cutting tools such as drills. 4,413,731., Cl. 206-379.000.

Weinhold, Harri; Vogel, Heinz-Rudiger; Kurze, Bernhard; Schlegel, Joachim; Rauschenbach, Dieter; Hering, Roland; Werner, Peter; and Wunsch, Heinz, to Veb Schwermaschinenbau Kombinat "Ernst Thalmann"Magdeburg. Process and arrangement for applying and drying liquid lubricant. 4,413,585., Cl. 118-61.000.

Weiss, Victor H.: *See*—
Rzepecki, Ray M.; and Weiss, Victor H., 4,414,260., Cl. 428-212.000.

Welbon, William W. Process for the synthesis of iron powder. 4,414,021., Cl. 75-0.5AA.

Well Research, Inc.: *See*—
Kervin, Kendall G., 4,413,676., Cl. 166-53.000.

Wellendorf, Klaus: *See*—
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Wellner, Edward; Michejda, Maria; and Hodgen, Gary D., to United States of America, Health & Human Services. Hydrocephalic antenatal vent for intrauterine treatment (HAVIT). 4,413,985., Cl. 604-9.000.

Wells, William E., Jr.; Marcum, S. Douglas; Downes, Lawrence W.; and Tilton, Richard A., to Miami University. Collision laser. 4,414,671., Cl. 372-73.000.

Weman, Per O., to N.V. Klippan S.A. Locking device reacting to inertia forces for retractors. 4,413,794., Cl. 242-107.40A.

Wenner, John W., to International Business Machines Corporation. Dual access flexible disk drive. 4,414,591., Cl. 360-99.000.

Werdecker, Waltraud: *See*—
Bruning, Rolf; Breidenbach, Poul-Erik; Cibis, Norbert; Aldinger, Fritz; and Werdecker, Waltraud, 4,414,014., Cl. 65-31.000.

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Wertz, David H.: *See*—
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Wessel, Gerhard: *See*—
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Wesaling, Wilhelm: *See*—
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Wesson, John P.: *See*—
Schilling, Curtis L., Jr.; Williams, Thomas C.; and Wesson, John P., 4,414,403., Cl. 556-430.000.

West, C. Thomas; and Basalay, Robert J., to Standard Oil Company (Indiana). Oxidized hydrocarbon-soluble polyamine-molybdenum compositions. 4,414,122., Cl. 252-49.700.

West, Joe E. Torque transmitting and blocking device. 4,413,713., Cl. 192-8.00R.

West, Peter J.: *See—*
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Westinghouse Electric Corp.: *See—*
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Conroy, Ernest F., Jr., 4,414,601., Cl. 361-97.000.
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Ichikawa, Yoshio; and Halgas, George M., 4,414,337., Cl. 501-103.000.

Westover, Brooke N.: *See—*
Petrik, John T.; and Westover, Brooke N., 4,414,463., Cl. 219-270.000.

Westwood, William D.: *See—*
Baraff, David R.; Serinken, Nur M.; Streater, Richard W.; Miner, Carla J.; Boynton, Robert J.; MacLaurin, Blair K.; and Westwood, William D., 4,413,883., Cl. 350-334.000.

Wetzel, Donald C., to Quest Corporation. Sheave block weighing assembly. 4,413,691., Cl. 177-147.000.

Wetzel, James H.: *See—*
Gale, Edward A.; Wetzel, John J., III; and Wetzel, James H., 4,414,610., Cl. 362-113.000.

Wetzel, John J., III: *See—*
Gale, Edward A.; Wetzel, John J., III; and Wetzel, James H., 4,414,610., Cl. 362-113.000.

Wetzel, Ludwig, to Schmid & Wezel, Firma. Motor-driven scraping tool. 4,413,412., Cl. 30-169.000.

Wetzel, Robert E.; and Marsh, Richard L., to Dayco Corporation. Method of making an endless power transmission belt. 4,414,047., Cl. 156-138.000.

Wey, Jong-Shinn; and Wilgus, Herbert S., to Eastman Kodak Company. Silver chlorobromide emulsions and processes for their preparation. 4,414,306., Cl. 430-434.000.

Whidden, Glenn H. Radio frequency detection circuitry having noise discrimination capability. 4,414,534., Cl. 340-310.00A.

White, Alfred K.: *See—*
Harris, Alan L.; and White, Alfred K., 4,414,630., Cl. 364-426.000.

White, Carl J. Method and apparatus for entrapment prevention and lateral guidance in passenger conveyor systems. 4,413,719., Cl. 198-333.000.

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White, Frederick A.: *See—*
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White, Loren H.: *See—*
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Whitehead, Larry W., to Leggett & Platt, Incorporated. Bed frame. 4,413,366., Cl. 5-201.000.

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VanDril, William A., 4,413,811., Cl. 266-190.000.

Whitney, Douglas A.; and Kavalhuna, Sergio, to Ford Motor Company. Automatic transaxle control system. 4,413,536., Cl. 74-869.000.

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Wiklund, Thore K. E., to Regioninvest i Norr AB. Hose-break valve. 4,413,643., Cl. 137-68.00R.

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Zandona, Oliver J.; and Hettinger, William P., Jr., to Ashland Oil, Inc. Upgrading carbo-metallic oils with used catalyst. 4,414,098., Cl. 208-120.000.

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Zassinovich, Grazia: *See—*
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Zoleski, Benjamin H.; and Sung, Rodney L., to Texaco Inc. Marine diesel cylinder oils containing polyoxyethylene sorbitol lanolin for improved spreadability. 4,414,123., Cl. 252-52.00A.

Zollinger, Hans R., to H. A. Schlatter AG. Method of welding continuous rails and apparatus therefor. 4,414,454., Cl. 219-53.000.

Zucker, Friedrich J.; Osthaus, Georg; and Fisch, Klaus, to Supraton F. J. Zucker GmbH. Process for continuously grinding and mixing starch-containing raw materials. 4,414,330., Cl. 435-93.000.

Zweifel, Hans; Schilling, Walter; Storni, Angelo; and Bellus, Daniel, to Ciba-Geigy Corporation. Tricyclic imidyl derivatives. 4,414,394., Cl. 548-451.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 8TH DAY OF NOVEMBER, 1983

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Fuji Electric Co., Ltd.: *See—*
Ueda, Shinya, Re. 31,438., Cl. 250-345.000.

Ueda, Shinya, to Fuji Electric Co., Ltd. Infrared ray gas analyzing apparatus. Re. 31,438., Cl. 250-345.000.

LIST OF REEXAM PATENTEES

TO WHOM

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Krueger, Lloyd H., to Century Envelope Co., Inc. Two-way envelope. B1 3,558,040., 11-8-83, Cl. 229-73.000.

Oana, Katsuo. Safe cartridge for gas. B1 4,219,126., 11-8-83, Cl. 220-89.00A.

Rohm and Haas Company: *See—*
Stambaugh, Robert L.; and Galluccio, Richard A., B1 4,146,489., Cl. 252-50.000.

Stambaugh, Robert L.; and Galluccio, Richard A., to Rohm and Haas Company. Polyolefin graft copolymers and lubricating oils and fuels containing same. B1 4,146,489., 11-8-83, Cl. 252-50.000.

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Abatie, Paul. Tool pouch. 271,253., 11-8-83, Cl. D2-400.000.

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Nishi, Roy M., 271,313., Cl. D21-48.000.
Renteria, William J., 271,312., Cl. D21-48.000.

Austin, Forrest L.; and Mackrell, William B., to Cornelius Company, The. Beverage dispensing valve. 271,270., 11-8-83, Cl. D7-398.000.

Austin, Forrest L.; and Mackrell, William B., to Cornelius Company, The. Beverage dispensing valve. 271,271., 11-8-83, Cl. D7-398.000.

Austin, Forrest L.; and Mackrell, William B., to Cornelius Company, The. Beverage dispensing valve. 271,272., 11-8-83, Cl. D7-398.000.

Austin, Forrest L.; and Mackrell, William B., to Cornelius Company, The. Beverage dispensing valve. 271,273., 11-8-83, Cl. D7-398.000.

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Bosch-Siemens Hausgerate GmbH: *See—*
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Bretl, Robert J., to R. A. Lockhart and Company. Golf putter head. 271,317., 11-8-83, Cl. D21-219.000.

Brother Kogyo Kabushiki Kaisha: *See—*
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Broyhill Furniture Industries, Inc.: *See—*
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Brunner, Merlin A.; Draheim, Harvey J.; and Schaffer, Michael J., to Simmons Universal Corporation. Crib footboard. 271,264., 11-8-83, Cl. D6-198.000.

Buckley, Betty H. Doll. 271,316., 11-8-83, Cl. D21-171.000.

Burgin, Ralph C.; and Cale, David B., to Dadant & Sons, Inc. Ventilated hat. 271,250., 11-8-83, Cl. D2-257.000.

Cale, David B.: *See—*
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Canning, Daniel; Viola, Vito; and Jordan, James B., to Oume Corporation. Ribbon cartridge or the like. 271,310., 11-8-83, Cl. D18-12.000.

Carlsson, Lars G. Planting box casing element or similar article. 271,289., 11-8-83, Cl. D11-164.000.

Cassini, Oleg L., to American Home Products Corporation. Fork or similar article. 271,267., 11-8-83, Cl. D7-137.000.

Cheng, Regan L., to Atari, Inc. Video game console. 271,311., 11-8-83, Cl. D21-13.000.

Ciciliot, Henry; and Ciciliot, Robert. Shotgun loading device. 271,321., 11-8-83, Cl. D22-7.000.

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Coughlin, William J.; Johnson, David E.; and McCall, Kenneth E., to Arcair Company. Heavy duty machine carriage. 271,290., 11-8-83, Cl. D12-36.000.

Criment, Avi. Illuminable key handle. 271,279., 11-8-83, Cl. D8-347.000.

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Dehne, Clarence A., to Jervis B. Webb Company. Combined conveyor carrier and track unit. 271,341., 11-8-83, Cl. D34-28.000.

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Fenne, Kenneth R., to Pittway Corporation. Smoke detector. 271,287., 11-8-83, Cl. D10-106.000.

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Green, David T.; Rawson, Paul; and Yagami, Richard, to United States Surgical Corporation. Powered skin stapler. 271,331., 11-8-83, Cl. D24-26.000.

Green, David T.; Rawson, Paul O.; and Yagami, Richard, to United States Surgical Corporation. Surgical occluding and cutting instrument. 271,332., 11-8-83, Cl. D24-26.000.

Green, John R.; and Turner, Charles D. Pair of binoculars. 271,307., 11-8-83, Cl. D16-133.000.

Grossman, Hyman, to Cambridge Instruments, Inc. Electrocardiographic recording paper. 271,334., 11-8-83, Cl. D24-99.000.

Guerra, Romeo E.; and Nelson, Robert H., to Nova Patents of North America, Inc. Igniter for gas discharge pipes. 271,327., 11-8-83, Cl. D23-90.100.

Gyebnar, Zoltan B. Plant hanger. 271,258., 11-8-83, Cl. D6-137.000.

Hauk, Ernest D., to Hawk Industries, Inc. Airplane. 271,294., 11-8-83, Cl. D12-344.000.

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Lauck, Howard. Pierced ear-ring holder. 271,286., 11-8-83, Cl. D9-457.000.

Lauren, Ralph, to Warner/Lauren Ltd. Bottle cap. 271,285., 11-8-83, Cl. D9-454.000.

Leatherwood, Bennie A. Lure for trout. 271,323., 11-8-83, Cl. D22-27.000.

Lee, Keith K. K., to Kee Cheong Lee's Co. Ltd. Combined dish rack and drainer. 271,339., 11-8-83, Cl. D32-55.000.

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Mak, Ting H. Desk telephone. 271,299., 11-8-83, Cl. D14-53.000.

Mak, Ting H. Desk telephone. 271,300., 11-8-83, Cl. D14-53.000.

Manning, Frank B.; Kramer, Peter R.; and Manning, T. Pat, to Zoom Telephonics, Inc. Telephone switch-connector unit. 271,301., 11-8-83, Cl. D14-59.000.

Manning, Frank B.; Kramer, Peter R.; and Manning, T. Pat, to Zoom Telephonics, Inc. Telephone switch-connector device. 271,302., 11-8-83, Cl. D14-59.000.

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Morris, Arthur R. Walker. 271,254., 11-8-83, Cl. D3-5.000.

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Templeton, Darrell L., to Adolph Coors Company. Barrel. 271,342., 11-8-83, Cl. D34-39.000.
Thom, Robert G. Lounge chair cover. 271,266., 11-8-83, Cl. D6-269.000.
Thrush, James L., to Anchor Hocking Corporation. Bottle or the like. 271,282., 11-8-83, Cl. D9-370.000.
Truglio, William, to Wright Laboratories, Inc. Fixed length blood container. 271,333., 11-8-83, Cl. D24-56.000.
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279 4,413,388
312 4,413,389
603 4,413,384

CLASS 27

32 4,413,390

CLASS 28

166 4,413,391

CLASS 29

157 R 4,413,392
157.1 R 4,413,393
157.3 B 4,413,394
157.3 C 4,413,395
407 4,413,396
410 4,413,398
416 4,413,397
428 4,413,399
515 4,413,400
571 4,413,401
4,413,402
4,413,403
590 4,413,404
596 4,413,405
609 4,413,406
825 4,413,407
4,413,408
856 4,413,409

CLASS 30

43.6 4,413,410
85 4,413,411
169 4,413,412
300 4,413,413
380 4,413,414

CLASS 33

125 R 4,413,416
174 G 4,413,419
174 L 4,413,418
174 M 4,413,417
180 AT 4,413,420
180 R 4,413,421
181 R 4,413,415
185 R 4,413,422
268 4,413,423
361 4,413,424

CLASS 34

1 4,413,425
27 4,413,426
46 4,413,427
100 4,413,428

CLASS 36

44 4,413,429
4,413,430
114 4,413,431

CLASS 37

142 A 4,413,432
190 4,413,433

CLASS 40

10 R 4,413,434
155 4,413,435
160 4,413,436

CLASS 42

50 4,413,437

CLASS 43

43.11 4,413,438
61 4,413,439
124 4,413,440

CLASS 46

116 4,413,441
151 4,413,442
206 4,413,443

CLASS 48

197 R 4,414,001
209 4,414,002

CLASS 49

409 4,413,444
445 4,413,445
470 4,413,446

CLASS 51

170 PT 4,413,447
313 4,413,448

CLASS 52

16 4,413,449
27 4,413,450
28 4,413,451
82 4,413,452
127.1 4,413,453
236.6 4,413,454
295 4,413,455
4,413,456
314 4,413,457
481 4,413,458
729 4,413,459
741 4,413,460

CLASS 53

122 4,413,461
399 4,413,463
412 4,413,464
540 4,413,462

CLASS 54

46 4,413,465

CLASS 55

18 4,414,003
48 4,414,004
75 4,414,005
190 4,414,006

CLASS 56

11.3 4,413,466
4,413,467
295 4,413,468

CLASS 57

293 4,413,469

CLASS 60

39.32 4,413,470
39.63 4,413,486
276 4,413,471
420 4,413,472
517 4,413,473
4,413,474
521 4,413,475
641.8 4,413,476
757 4,413,477

CLASS 62

12 4,414,007
98 4,413,478
101 4,413,479
112 4,413,480
371 4,413,481

CLASS 65

3.12 4,414,008
4.3 4,414,009
16 4,414,010
18.1 4,414,011
18.2 4,414,012
28 4,414,013
31 4,414,014
60.3 4,414,015
141 4,414,016

CLASS 66

60 H 4,413,487
78 4,413,482
125 R 4,413,483
193 4,413,484

CLASS 70

57 4,413,488
81 4,413,489
164 4,413,490
252 4,413,491
416 4,413,492
422 4,413,493

CLASS 71

88 4,414,017
4,414,018
91 4,414,019
108 4,414,020

CLASS 72

71 4,413,485
167 4,413,494
196 4,413,495
356 4,413,496
4,413,497
405 4,413,498
446 4,413,499
465 4,413,500

CLASS 73

23 4,413,502
40.7 4,413,503
49.6 4,413,501
61.1 C 4,413,504
4,413,505
64.4 4,413,506
104 4,413,507
116 4,413,508
117.3 4,413,509
150 A 4,413,510
152 4,413,512
155 4,413,511
162 4,413,513
204 4,413,514
296 4,413,515
431 4,413,516
597 4,413,517
609 4,413,520
615 4,413,518
626 4,413,521
646 4,413,522
660 4,413,519
701 4,413,523
707 4,413,524
741 4,413,525
745 4,413,526
753 4,413,528
754 4,413,527
756 4,413,529
861.25 4,413,531
861.47 4,413,530
861.61 4,413,532
863.31 4,413,533
864.21 4,413,534

CLASS 74

688 4,413,535
869 4,413,536

CLASS 75

0.5 AA 4,414,021
26 4,414,022
124 4,414,023
126 C 4,414,024
129 4,414,025
130.5 4,414,026
252 4,414,029

CLASS 76

101 R 4,413,537

CLASS 81

57.13 4,413,538

CLASS 82

2 R 4,413,539
47 4,413,540

CLASS 83

346 4,413,541
455 4,413,542

CLASS 84

1.03 4,413,543
1.24 4,413,544
1.28 4,413,545

CLASS 89

33 D 4,413,546

CLASS 91

216 R 4,413,547
491 4,413,548

CLASS 92

3 R 4,413,549

CLASS 98

2 4,413,550
40 V 4,413,551

CLASS 99

295 4,413,552

CLASS 100

4 4,413,553
43 4,413,554
214 4,413,555

CLASS 101

40 4,413,556
44 4,413,557
93.14 4,413,558
123 4,413,559
247 4,413,560
365 4,413,561
408 4,413,562

CLASS 102

214 4,413,563
501 4,413,564
503 4,413,565
517 4,413,566
525 4,413,567

CLASS 104

20 4,413,568

CLASS 105

168 4,413,569

CLASS 106

90 4,414,030
4,414,031
4,414,034
186 4,414,032

CLASS 108

153 4,413,570

CLASS 110

234 4,413,571
331 4,413,572
347 4,413,573

CLASS 112

121.12 4,413,574
129 4,413,575
158 B 4,413,576
158 E 4,413,577
184 4,413,579
254 4,413,578
262.2 4,413,580
278 4,413,581
311 4,413,582

CLASS 114

350 4,413,583

CLASS 118

56 4,413,584
61 4,413,585
206 4,413,586
210 4,413,587

CLASS 119

106 4,413,588
109 4,413,589

CLASS 122

18 4,413,590
235 R 4,413,591
510 4,413,592

CLASS 123

1 A 4,413,593
3 4,413,594
41.1 4,413,596
41.42 4,413,597
142.5 R 4,413,595
306 4,413,598
425 4,413,599
449 4,413,600
480 4,413,601
486 4,413,602
510 4,413,603
515 4,413,604
547 4,413,605
550 4,413,606
590 4,413,607
599 4,413,608

CLASS 126

25 R 4,413,609
39 E 4,413,611
39 K 4,413,610
92 C 4,413,612
292 4,413,613
421 4,413,614
434 4,413,615
443 4,413,616
4,413,617
450 4,413,618

CLASS 128

76 R 4,413,619
134 4,413,620
156 4,413,621
205.25 4,413,622
399 4,413,624
425 4,413,625
498 4,413,626
635 4,413,627
4,413,628
660 4,413,629
661 4,413,630
677 4,413,631
716 4,413,632
736 4,413,633
746 4,413,634
782 4,413,635
786 4,413,636

CLASS 131

84 R 4,413,637
174 4,413,638
276 4,413,639
281 4,413,640
361 4,413,641

CLASS 134

3 4,414,035
23 4,414,036
35 4,414,037

CLASS 137

14 4,413,642
68 R 4,413,643
103 4,413,644
223 4,413,645
240 4,413,646
312 4,413,647
486 4,413,648
505.39 4,413,649
596.13 4,413,650
625.25 4,413,651

CLASS 138

31 4,413,652
89 4,413,653
92 4,413,654
97 4,413,655
110 4,413,656
149 4,413,657

CLASS 139

436 4,413,658

CLASS 140

3 CA 4,413,659
119 4,413,660

CLASS 144

2 Z 4,413,661
356 4,413,662

CLASS 148

4 4,414,038
6.2 4,414,039
6.3 4,414,040
9.6 4,414,041
12 R 4,414,042
16 4,414,043

CLASS 149

2 4,414,044

CLASS 152

353 R 4,413,663

CLASS 156

73.2 4,414,045
73.5 4,414,046
132 4,414,047
159 4,414,048
166 4,414,049
4,414,050
198 4,414,051
273.7 4,414,052
308.2 4,414,053
384 4,414,054
423 4,414,055
476 4,414,056
643 4,414,057
4,414,058
659.1 4,414,059

CLASS 160

178 C 4,413,664
315 4,413,665

CLASS 162

36 4,414,060
295 4,414,061
336 4,414,062

CLASS 164

72 4,413,666
154 4,413,667

CLASS 165

1 4,413,668
4,413,669
4,413,670
4,413,671
22 4,413,672
95 4,413,673
104.33 4,413,674
119 4,413,675

CLASS 166

53 4,413,676
55.1 4,413,677
57 4,413,678
248 4,413,679
270 4,413,680
293 4,413,681
382 4,413,682

CLASS 169

48 4,413,683

CLASS 172

4.5 4,413,684
316 4,413,685

CLASS 173

131 4,413,686
134 4,413,687

CLASS 174

28 4,414,424
35 GC 4,414,425
59 4,414,426
65 R 4,414,427
126 S 4,414,428
179 4,414,429

CLASS 175

38 4,413,688
409 4,413,689

CLASS 177

54 4,413,690
147 4,413,691

CLASS 179

2 TV 4,414,432
70 4,414,433
77 4,414,434
81 R 4,414,435
110 A 4,414,436
115.5 VC 4,414,437

CLASS 180

11 4,413,692
74 4,413,693
89.14 4,413,694
4,413,695
4,413,696
120 4,413,697
219 4,413,699
4,413,700
256 4,413,701
274 4,413,702
305 4,413,698

CLASS 181

156 4,413,703
176 4,413,704
240 4,413,705

CLASS 182

91 4,413,706
150 4,413,707

CLASS 187

9 R 4,413,708

CLASS 188

67 4,413,387

CLASS 191

70 4,413,710

CLASS 192

0.033 4,413,714
3.28 4,413,711
4 A 4,413,712
8 R 4,413,713
53 F 4,413,715
70.12 4,413,716
84 C 4,413,717

CLASS 194

1 K 4,413,718

CLASS 198

333 4,413,719
344 4,413,709
345 4,413,720
365 4,413,721
392 4,413,722
415 4,413,723
594 4,413,724

CLASS 200

6 A 4,414,438
38 R 4,414,439
50 B 4,414,440
61.04 4,414,441
61.27 4,414,442
80 R 4,414,443
144 B 4,414,447
4,414,448
144 R 4,414,446
146 R 4,414,449
147 R 4,414,450
148 A 4,414,445
148 H 4,414,451
159 B 4,414,452

CLASS 202

170 4,414,067
248 4,414,072

CLASS 203

21 4,414,074
66 4,414,063

CLASS 204

15 4,414,075
4,414,076
34 4,414,078
35 N 4,414,077
37 R 4,414,064
75 4,414,079
81 4,414,065
129 4,414,080
129.3 4,414,066
159.18 4,414,081
162 R 4,414,082
4,414,083
165 4,414,084
181 C 4,414,068
192 C 4,414,085
192 E 4,414,069
192 M 4,414,086
4,414,087
225 4,414,070
237 4,414,088
242 4,414,071
244 4,414,089
252 4,414,090
277 4,414,091
294 4,414,092
299 R 4,414,073
412 4,414,093

CLASS 206

45.13 4,413,726
45.33 4,413,725
63.3 4,413,727
187 4,413,728
188 4,413,729
232 4,413,730
379 4,413,731
387 4,413,732
446 4,413,733
455 4,413,734
523 4,413,735
566 4,413,736
599 4,413,737

CLASS 208

8 LE 4,414,094
44 4,414,095
4,414,096
59 4,414,097
120 4,414,098
121 4,414,099
153 4,414,100
4,414,101
211 4,414,102
212 4,414,103
251 R 4,414,104
309 4,414,105

CLASS 209

155 4,414,106
166 4,414,107
523 4,413,738
593 4,413,739

CLASS 210

198.2 4,414,108
278 4,414,109
321.3 4,414,110
500.2 4,414,111
512.1 4,414,112
636 4,414,113
652 4,414,114
665 4,414,115
695 4,414,116
710 4,414,117

CLASS 211

26 4,413,740

CLASS 215

100 R 4,413,741
216 4,413,742
4,413,743
355 4,413,744

CLASS 219

10.55 F 4,414,453
53 4,414,454
64 4,414,455
69 W 4,414,456
4,414,457
4,414,458
73.2 4,414,459
121 L 4,414,461
121 LD 4,414,460
121 LM 4,414,444
202 4,414,462
270 4,414,463
312 4,414,464
449 4,414,465
459 4,414,466

CLASS 220

23.4 4,413,745
89 A 4,413,746
B1 44,219,126
225 4,413,747
281 4,413,748

CLASS 221

1 4,413,749
263 4,413,750

CLASS 222

1 4,413,751
56 4,413,752
105 4,413,757
149 4,413,753
195 4,413,758
209 4,413,754
213 4,413,759
309 4,413,760
402.11 4,413,756
402.2 4,413,755

CLASS 224

42.45 R 4,413,761
250 4,413,762

CLASS 225

2 4,413,763

CLASS 226

170 4,413,764

CLASS 228

119 4,413,765
123 4,413,766
136 4,413,767
173 A 4,413,768

CLASS 229

27 4,413,769
73 B1 3,558,040

CLASS 232

17 4,413,770

CLASS 235

381 4,414,467
462 4,414,468

CLASS 236

9 A 4,413,774
20 R 4,413,775
49 4,413,776

CLASS 238

349 4,413,777

CLASS 239

17 4,413,778
45 4,413,779
91 4,413,781
102 4,413,782
183 4,413,783
426 4,413,784
443 4,413,785
533.4 4,413,780
542 4,413,786
4,413,787
703 4,413,788

CLASS 241

46.17 4,413,789
101 B 4,413,790

CLASS 242

18 G 4,413,791
67.1 R 4,413,792
68 4,413,793
107.4 A 4,413,794

CLASS 244

3.22 4,413,795
35 R 4,413,796

CLASS 248

27.1 4,413,797
4,413,798
59 4,413,799
99 4,413,800
316 A 4,413,801
362 4,413,802
475 B 4,413,803

CLASS 250

201 4,414,469
204 4,414,470
227 4,414,471
345 Re.31,438
359.1 4,414,472
366 4,414,473
396 R 4,414,474
506.1 4,414,475
563 4,414,476

CLASS 251

144 4,413,804
297 4,413,805
340 4,413,806

CLASS 252

8.55 C 4,414,118
8.55 D 4,414,119
4,414,120
49.5 4,414,121
49.7 4,414,122
50 B1 4,146,489
52 A 4,414,123
62.63 4,414,124
75 4,414,125
78.3 4,414,126
95 4,414,127
111 4,414,128
135 4,414,129
140 4,414,130
299.1 4,414,131
506 4,414,142
514 4,414,143
548 4,414,144
645 4,414,145

CLASS 254

43 4,413,807
134.3 FT 4,413,808

CLASS 260

97 4,414,146
112 B 4,414,148
112 R 4,414,147
112.5 R 4,414,150
112.5 T 4,414,149
145 B 4,414,151
185 4,414,152
239.1 4,414,153
245.2 T 4,414,155
245.7 4,414,154
352 4,414,156
428.5 4,414,157
438.1 4,414,158
465.6 4,414,159
544 A 4,414,160
975 4,414,161

CLASS 261

23 A 4,414,162
69 A 4,414,163

CLASS 264

1.2 4,414,164
1.5 4,414,165
25 4,414,166
40.5 4,414,167
49 4,414,168
210.7 4,414,169
242 4,414,170
249 4,414,171
255 4,414,172
257 4,414,173
328.6 4,414,174
531 4,414,175

CLASS 266

48 4,413,809
94 4,413,810
190 4,413,811
195 4,413,812
216 4,413,813
251 4,413,814
265 4,413,815
270 4,413,816

CLASS 267

64.11 4,413,817

CLASS 269

81 4,413,818
99 4,413,819

CLASS 271

101 4,413,820

CLASS 272

69 4,413,821

CLASS 273

73 C 4,413,822
153 S 4,413,823
163 R 4,413,824
175 4,413,825
176 AB 4,413,827
186 C 4,413,826
236 4,413,828

CLASS 277

3 4,413,829
27 4,413,830
40 4,413,831

CLASS 280

12 R 4,413,832
47.22 4,413,833
47.26 4,413,834
154.5 R 4,413,839
204 4,413,835
423 B 4,413,836
707 4,413,837
751 4,413,838
784 4,413,840
802 4,413,841
825 4,413,842

CLASS 282

27.5 4,413,843

CLASS 285

16 4,413,844
23 4,413,845
317 4,413,846

CLASS 289

17 4,413,847

CLASS 290

55 4,414,477

CLASS 292

59 4,413,848
229 4,413,849
256.69 4,413,850
259 4,413,851
4,413,852

CLASS 294

64 R 4,413,853

CLASS 296

146 4,413,854
162 4,413,855
188 4,413,856

CLASS 297

180 4,413,857
188 4,413,858

CLASS 299

4 4,413,859

CLASS 301

63 PW 4,413,860

CLASS 303

6 C 4,413,861

CLASS 305

10 4,413,862

CLASS 307

116 4,414,478
253 4,414,479
443 4,414,480

CLASS 308

5 R 4,413,863
4,413,864
207 R 4,413,865
217 4,413,866

CLASS 310

42 4,414,481
334 4,414,482

CLASS 312

111 4,413,867
211 4,413,868
236 4,413,869

CLASS 313

136 4,414,483
273 4,414,484
451 4,414,485

CLASS 315

3.6 4,414,486
5 4,414,487
39 4,414,488
51 4,414,489
169.4 4,414,490
282 4,414,491
290 4,414,492
308 4,414,493
395 4,414,494

CLASS 318

571 4,414,495
696 4,414,496
4,414,497
4,414,498
798 4,414,499
799 4,414,500

CLASS 323

280 4,414,501
315 4,414,502
4,414,503

CLASS 324

78 R 4,414,504
85 4,414,505
158 P 4,414,506
210 4,414,507
238 4,414,508
250 4,414,509
252 4,414,510
347 4,414,511

CLASS 328

151 4,414,512

CLASS 330

204 4,414,513
262 4,414,514

CLASS 331

111 4,414,515

CLASS 333

21 A 4,414,516
167 4,414,517

CLASS 335

205 4,414,518
208 4,414,519
4,414,520
281 4,414,521
291 4,414,522
302 4,414,523

CLASS 337

87 4,414,524
92 4,414,525
163 4,414,526
180 4,414,527
187 4,414,528
365 4,414,529

CLASS 338

25 4,414,530
34 4,414,531

CLASS 339

6 R 4,413,870
14 R 4,413,871
59 M 4,413,872
74 R 4,413,873
151 B 4,413,874
217 R 4,413,875
244 B 4,413,876

CLASS 340

26 4,414,532
52 R 4,414,533
310 A 4,414,534
347 AD 4,414,535
347 DD 4,414,536
365 R 4,414,537
365 S 4,414,538
500 4,414,539
508 4,414,540
566 4,414,541
578 4,414,542
651 4,414,543
767 4,414,544
790 4,414,545
825.3 4,414,546
825.83 4,414,547

CLASS 343

8 4,414,548
18 E 4,414,549
700 MS 4,414,550
903 4,414,551

CLASS 346

1.1 4,414,552
4,414,553
74.5 4,414,554
76 PH 4,414,555
160 4,414,556

CLASS 350

1.7 4,413,877
6.7 4,413,878
96.19 4,413,879
96.20 4,413,880
4,413,881
96.30 4,413,882
334 4,413,883
338 4,413,884
342 4,413,885
392 4,413,886
426 4,413,887
432 4,413,888
501 4,413,889

CLASS 351

221 4,413,890
235 4,413,891

CLASS 354

21 4,413,892
195 4,413,893
4,413,894
234 4,413,895
277 4,413,896

CLASS 355

3 CH 4,413,897
3 P 4,413,898
3 SH 4,413,901
4 4,413,899
8 4,413,900
48 4,413,902
68 4,413,903

CLASS 356

5 4,413,904
4,413,905
141 4,413,906
4,413,907
346 4,413,908
354 4,413,909
377 4,413,910
438 4,413,911

CLASS 357

16 4,414,557
17 4,414,558
38 4,414,559
39 4,414,560
67 4,414,561
81 4,414,562

CLASS 358

21 R 4,414,563
37 4,414,564
89 4,414,565
101 4,414,566
139 4,414,567
4,414,568
153 4,414,569
154 4,414,570
158 4,414,571
163 4,414,573
172 4,414,572
184 4,414,574
227 4,414,575
229 4,414,576
242 4,414,577
243 4,414,578
256 4,414,579
260 4,414,580
280 4,414,581
282 4,414,582
300 4,414,583
342 4,414,584

CLASS 360

40 4,414,585
70 4,414,586
76 4,414,587
77 4,414,589
84 4,414,588
97 4,414,590
99 4,414,591
102 4,414,592
4,414,593
106 4,414,594
115 4,414,595
129 4,414,596
133 4,414,597

CLASS 361

18 4,414,598
56 4,414,599
4,414,600
97 4,414,601
190 4,414,602
227 4,414,603
385 4,414,604
388 4,414,605
397 4,414,606
433 4,414,607

CLASS 362

32 4,414,608
33 4,414,609
113 4,414,610
183 4,414,611
188 4,414,612
264 4,414,615
267 4,414,613
269 4,414,614
308 4,414,616
404 4,414,617
417 4,414,618

CLASS 363

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36 4,414,649
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75 4,413,913
137 4,413,914

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27 4,414,651
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103 4,414,654
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CLASS 382

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248 4,413,920

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270 4,413,956
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311 4,413,971
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	257	271,250		269	271,266		370	271,282	D14—	11	271,298		76	271,314			271,330
	320	271,251	D7—	137	271,267		415	271,283		53	271,299		78	271,315	D24—	26	271,331
	400	271,252		350	271,268		438	271,284			271,300		171	271,316			271,332
		271,253		363	271,269		454	271,285		59	271,301		219	271,317		56	271,333
D3—	5	271,254		398	271,270		457	271,286			271,302		231	271,318		99	271,334
	61	271,255			271,271	D10—	106	271,287	D15—	1	271,303		234	271,319			271,335
D6—	32	271,256			271,272		126	271,288		144	271,304	D22—	1	271,320			
	47	271,257			271,273	D11—	164	271,289	D16—	36	271,305		7	271,321	D26—	138	271,336
	137	271,258	D8—	23	271,274	D12—	36	271,290		42	271,306		27	271,322	D28—	85	271,337
	154	271,259		26	271,275		86	271,291		133	271,307			271,323	D29—	6	271,338
	161	271,260		91	271,276		180	271,292		135	271,308		28	271,324	D32—	55	271,339
	167	271,261		330	271,277		204	271,293	D18—	1	271,309	D23—	4	271,325			271,340
	168	271,262		339	271,278		344	271,294		12	271,310		65	271,326	D34—	28	271,341
	179	271,263		347	271,279	D13—	24	271,295	D21—	13	271,311		90.1	271,327		39	271,342
	198	271,264	D9—	349	271,280			271,296		48	271,312		139	271,328		43	271,343

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

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